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RESEARCH

## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : GALAXY  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Berney-J. (JBE)  
KEYWORDS : proctor-schwartz, burley, temperature, sensor,  
profile, ftr, munich, berlin, boz

---

### OBJECTIVE

Study the impact of processing practices on microbiological, chemical and physical properties of tobacco and develop viable solutions, make recommendations and establish specifications in order to avoid tobacco quality loss during processing and storage.

### STATUS

The establishment of Burley temperature profiles along P&S treatment in the four european primaries has been completed.

### RESULTS

Tobacco temperature profiles were determined in the middle and on both sides of P&S dryers with DATATRACE needle sensors as described previously [1]. Five dryers were investigated at FTR, Munich, Berlin and two at BOZ. Average results of ten determinations per position are presented in Figs. 1 to 4. Few temperature variations are observed in the apron-band width in Berlin and BOZ while in Munich and FTR a 10°C difference is observed in the cooling zone. The comparison between the four treatments (both BOZ dryers operating in the same way), shows that tobacco temperature and time spent by the tobacco in the dryers are different. Tobacco temperature is a function of the air settings (flow, temperature, rH) and tobacco flow (carpet depth) while time is a function of dryer length and apron-band speed.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### Drying

Tobacco temperature at the end of the drying zone is between 59 and 62°C for all P&S dryers. Similarities are observed between Berlin and BOZ and FTR and Munich. In the first case, tobacco temperature increases rapidly and then is stabilized during the last 2/3 of the drying zone. In the second situation, temperature increases continuously until the beginning of cooling.

### Cooling

The purpose of the cooling zone is to reduce tobacco temperature before reordering. A decrease of 10°C is observed from the end of the drying zone in Berlin and BOZ. Cooling is more pronounced in Munich and Neuchatel with a 15-20°C temperature drop.

### Reordering

For Berlin and Munich, tobacco temperature during reordering is equivalent to that during drying. In BOZ, temperature increases up to 72°C during the first reordering section and then decreases to 60°C at the exit. At FTR, the reordering seems to be interrupted after tobacco temperature increases from 45°C during cooling to 65°C at the dryer exit.

Fig. 5 summarizes the different P&S treatments with the same time-scale presentation. Residence time in the dryer varies from 5.5 minutes at FTR and 17.5 minutes in Berlin. The pie-charts show the respective proportions of the three P&S zones reported to the total residence time. In Berlin, BOZ and Munich, drying and reordering times are equal with the cooling zone representing approximately 10%. In FTR, drying contributes for more than 60%, cooling for 15% and reordering for 22% only.

### PLANS

- Measure the air settings (temperature and relative humidity) along each P&S treatment.
- Profile tobacco temperature in cut tobacco dryers in Berlin and Munich.

### REFERENCES

- [1] Berney-J. and Hofer-M., Quarterly Report, Project GALAXY, October-December 1990.





Figure 1 : PM-BERLIN BURLEY TREATMENT

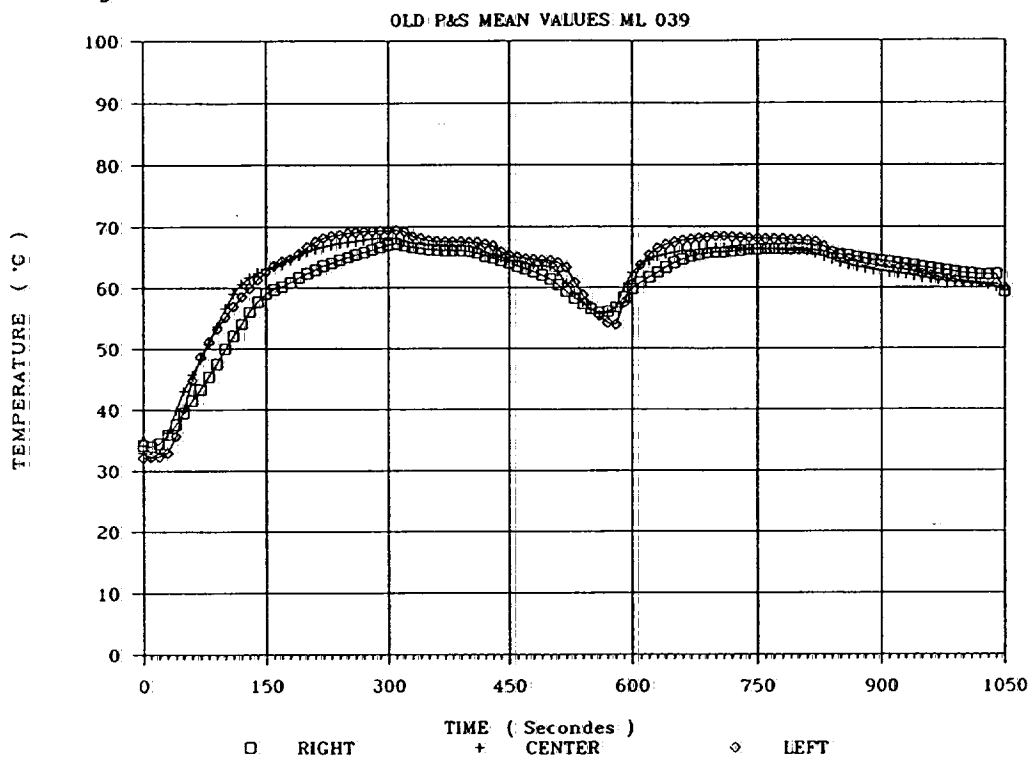
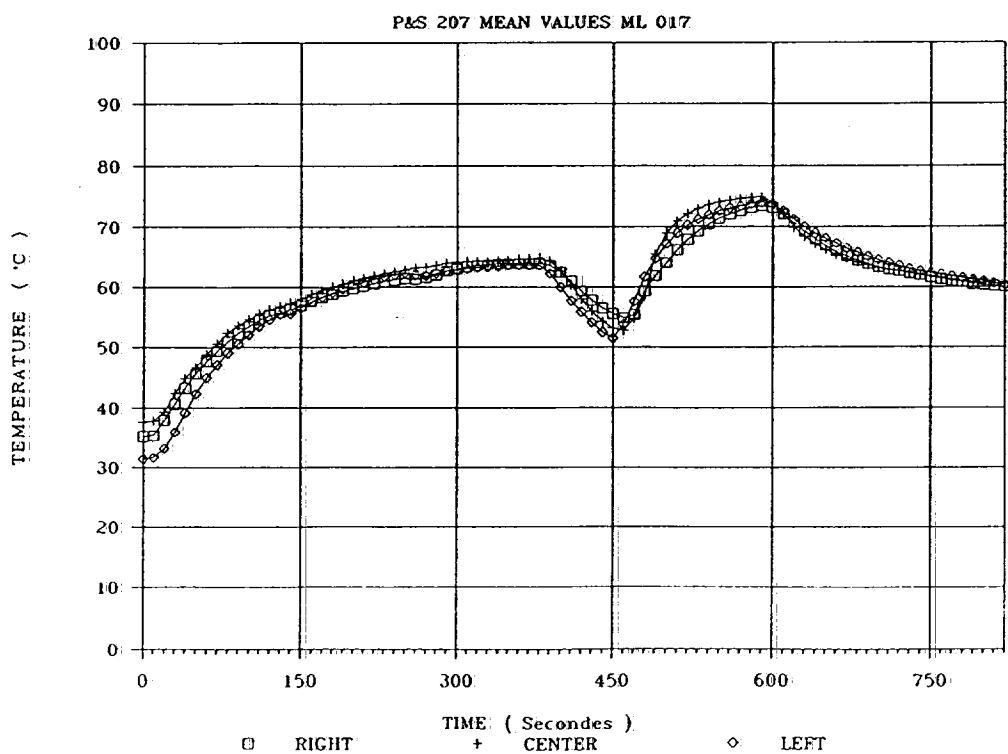


Figure 2 : PM-BOZ BURLEY TREATMENT



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Figure 3 : PM-MUNICH BURLEY TREATMENT

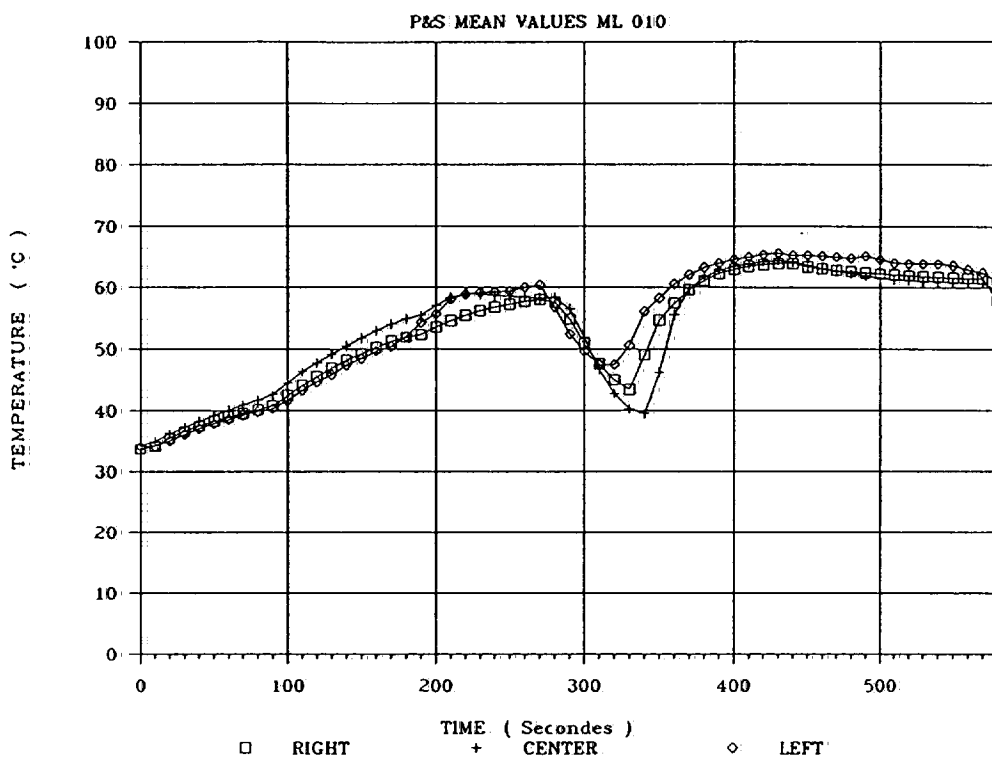
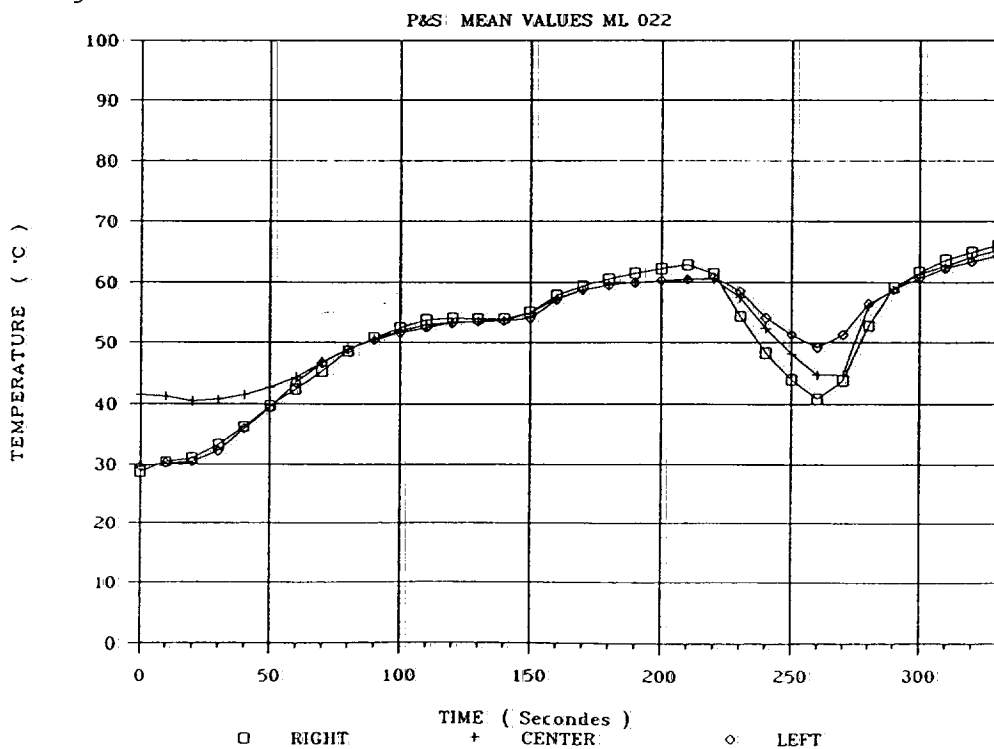


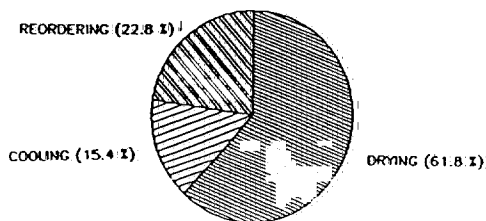
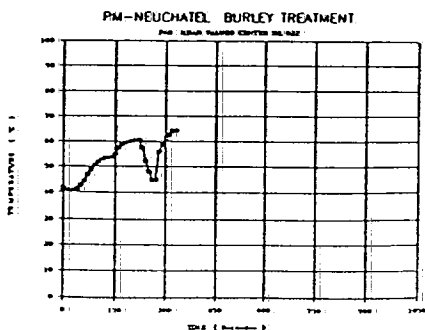
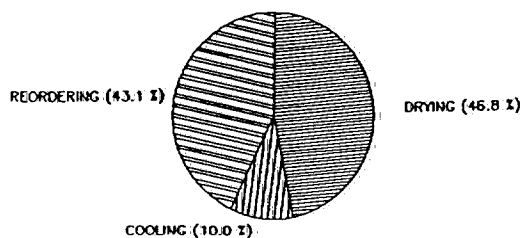
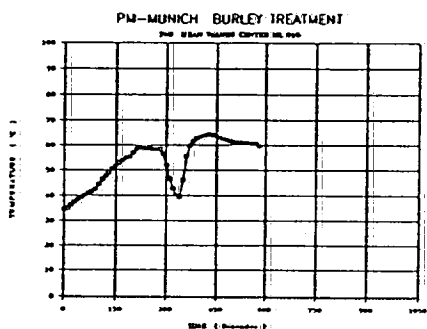
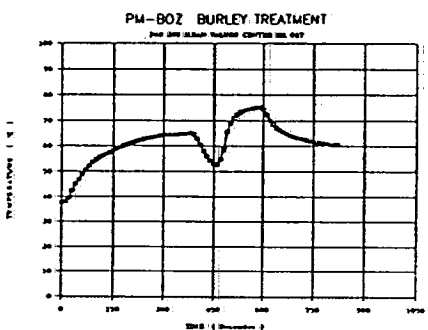
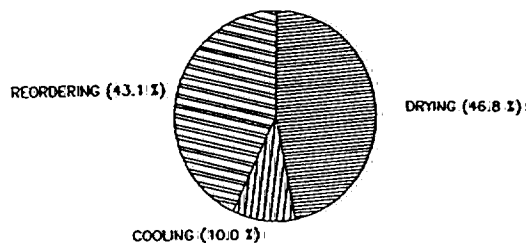
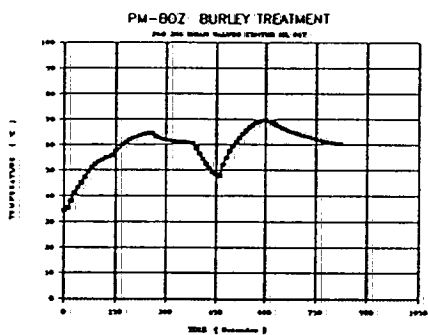
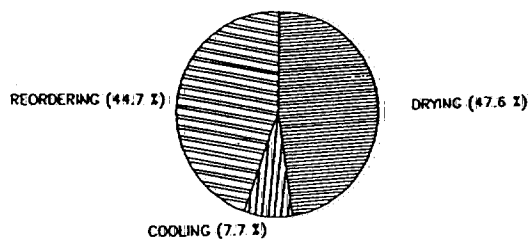
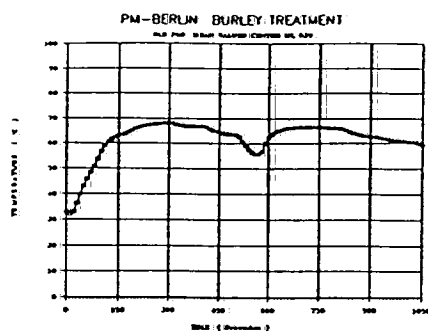
Figure 4 : PM-NEUCHATEL BURLEY TREATMENT



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Figure 5 :

ZONES PROPORTION DURING P&S TREATMENT



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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : MICROBIOLOGICAL ANALYSES  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Hofer-M. (MIH)  
KEYWORDS : ato, strips, off-taste, bacteria,  
microbiology, burley-top, box, kiss, shipment,  
cut-filler, vacuum, conditioning, dcc,  
germination, temperature, legg, dryer,  
process-air, bypass-air, spore, subjective,

---

### ATO - FINLAND

ML cigarettes produced in Finland from total-blend strips, before and after storage over a weekend, were analysed for their microbiological status [1,2]. Neither molds nor yeasts could be detected on either version. No significant differences were found in total bacterial counts as well as in the spore proportions. Results are in line with a standard ML microbiological profile. Subjective evaluation did not show significant differences; both versions well up to standard [3].

### ML - UK EX BOZ

At the request of PMH, off-taste ML-UK cigarettes produced from two batches were analysed for their microbiological content. Results were compared with those obtained with a reference cigarette [4]. No significant differences could be found between the three samples. Total bacterial counts were around  $2.5 \times 10^6$ , the proportion of dormant spores accounting for 90 % [5]. The problem was related to Burley Top Flavor handling.

### PROJECT KISS

At the request of PM-EEMA, the microbial profiles of two ML cigarettes were established in the context of the PM 80 boxes evaluation. The control was processed normally in Richmond. For the test, PM 80 boxes containing the cut filler were air-mailed to England and then shipped back to Richmond for cigarette making. Twice as many bacteria were found in the test as in the control, but both counts were in accordance with our standard

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

profile. 100 % spores were also found in the test, indicating that conditions for spore germination were not encountered during shipment [6]. Due to negative subjective evaluation, the use of PM 80 boxes for shipping cut filler was not recommended [7].

### DCC - UNIT

At the request of PMH-QA, the microbiology of cigarette samples produced from tobacco processed through vacuum chambers, conditioning and the Dickinson Conditioning Cylinder (DCC), was compared [8]. Total bacterial counts were found to be similar in both samples. However, the dormant spore proportion after DCC processing was found to be 10 % above that of vacuum treatment, indicating *Bacillus* spore germination to be less activated in the DCC-unit [9].

### AMF - LEGG

At the request of PMH Engineering, tobacco temperature was profiled in AMF-LEGG dryers. Five different air settings were tested. As reference, temperature was first recorded in both LEGG dryers in production conditions. As expected, the tobacco temperature in dryer 716 with air bypass was approx. 7°C lower than the temperature recorded in dryer 729 (Fig. 1) [10]. Trials were conducted by varying the ratio between process and bypass air flows on dryer 716. Fig. 2 shows that only slight differences were observed between the trials. For instance, by increasing process air flow from 20 to 30 M3/min., only a slight decrease in tobacco temperature was observed due to water vaporisation. Increasing bypass air flow did not affect tobacco temperature. For each setting, samples were taken after the dryer for microbiological analyses. No significant differences could be observed for total bacterial counts as well as spore proportions. In the references, however, a difference was observed between dryers 716 and 729. In spite of the same total bacterial counts, the proportion of dormant spores after dryer 729 was 17 % lower than after dryer 716. This indicates that conditions encountered in dryer 729 were more propitious to spore germination. Cigarettes produced through dryer 716 were subjectively preferred.

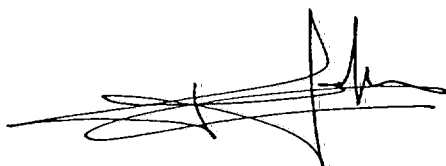
### REFERENCES

- [1] Memo from Mäder-D. to Hofer-M., March 28, 1990.
- [2] Profs note from Hofer-M. to Mäder-D., April 27, 1990.

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- [3] Profs note from Mäder-D. to Hofer-M., May 9, 1990.
- [4] Profs note from Guequierre-J. to Berney-J., May 28, 1990.
- [5] Profs note from Hofer-M. to van Duuren-B., June 6, 1990.
- [6] Profs note from Hofer-M. to Buttica-B., June 25, 1990.
- [7] Profs note from Stathopoulos-A. to Buttica-B., June 25, 1990.
- [8] Memo from Smits-S. to Hofer-M., May 5, 1990.
- [9] Profs note from Hofer-M. to Smits-S., May 5, 1990.
- [10] Profs note from Hofer-M. to van Duuren-B., July 3, 1990.

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Figure 1 : BOZ AMF LEGG DRYER COMPARAISON

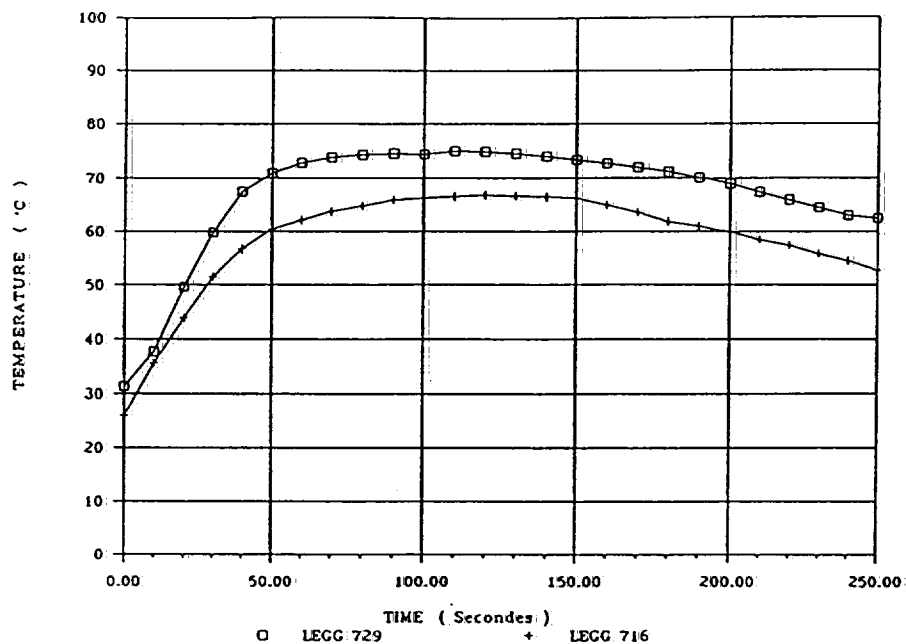
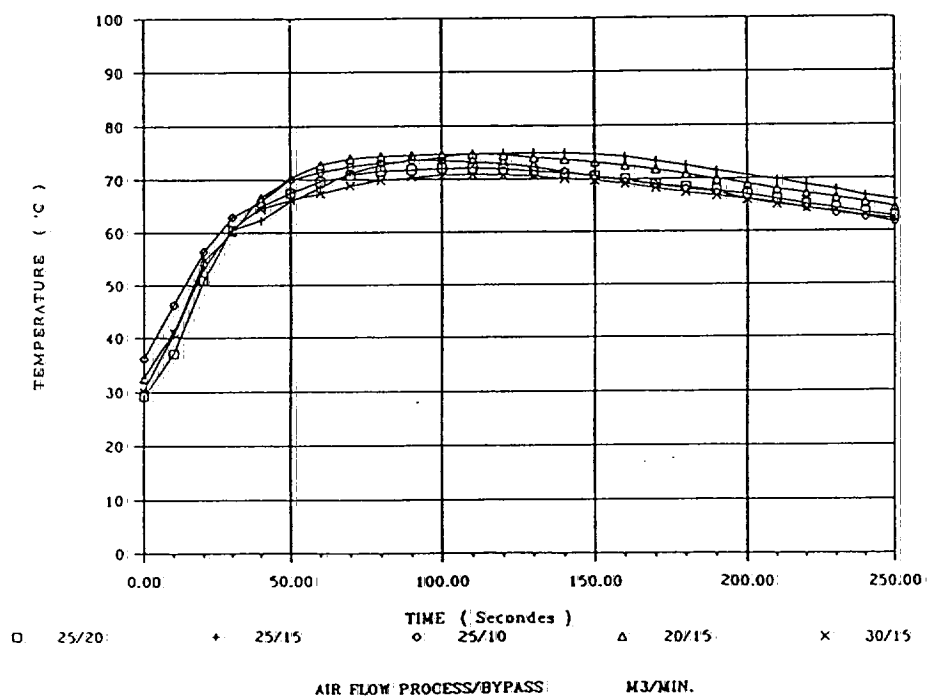


Figure 2 : BOZ AMF LEGG DRYER 716 ML 017 TEST



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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : MICROBIOLOGICAL METHODS  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Morel-P. (PAM)  
KEYWORDS : bacteria, spore, method, count,  
pasteurisation, statistic

---

### OBJECTIVE

Review our traditional plate count method used to quantify the tobacco bacterial population.  
Evaluate statistically the impact of individual steps on final count.  
Change method conditions when necessary.

### STATUS

The impact of extraction, pasteurisation, inoculation and incubation conditions on total count have been re-evaluated. Special emphasis has been placed on the pasteurisation step which determines spore proportion in the bacterial population.

### RESULTS

The global statistical analysis of all the results obtained in this study shows that variation of results can be explained (92%) by the parameters involved [1].  
For the total count, agitation speed during tobacco extraction (Fig. 1) and the nature of the incubation medium (Fig. 2) are the most important parameters involved in result variations. For spore evaluation, pasteurisation conditions (temperature and time) are found to be predominant.  
Remaining variations can be attributed to the tobacco itself and can be reduced by increasing the number of analyses.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### CONCLUSIONS

Based on results, the method is modified as follows:

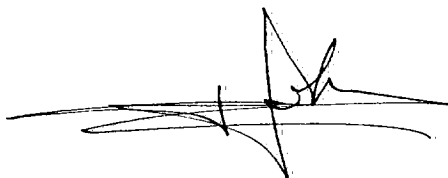
- Agitation speed during extraction is increased from 220 to 280 rpm.
- The nutrient agar medium is replaced by the TSA (Trypticase Soya Agar) medium.
- Pasteurisation conditions are changed from 78°C/12 min. to 70°C/30 min.
- The number of analyses per sample is increased from 3 to 5.

### PLANS

Prepare a final report including all results and statistical evaluations.

### REFERENCE

- [1] Reports from Wong-Y. to Morel-P., April-June 1990.

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Figure 1 : EFFECT OF AGITATION SPEED ON TOTAL BACTERIAL COUNT  
DURING TOBACCO EXTRACTION

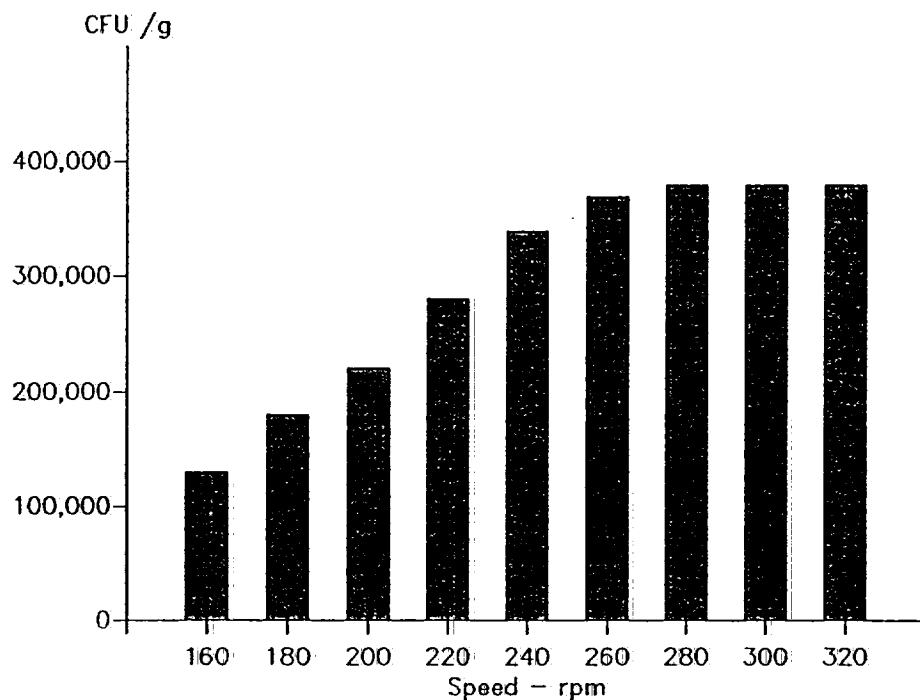
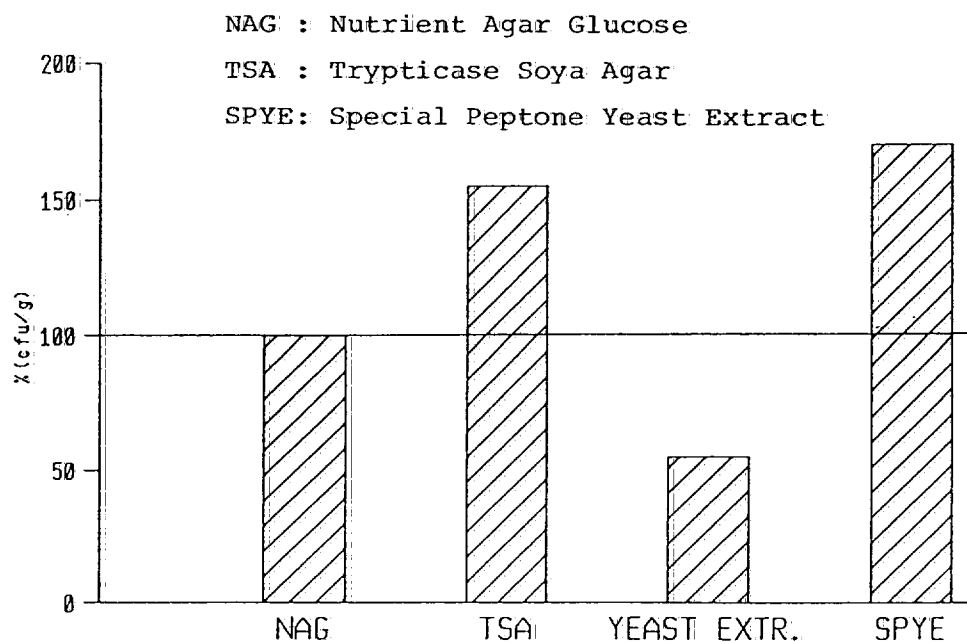


Figure 2 : INFLUENCE OF INCUBATION MEDIA ON TOTAL COUNT



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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : EUROP  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Kälín-P. (PAK)  
KEYWORDS : bacillus, spore, germination, tobacco, cut  
filler, inhibition, d-alanine, water-activity,  
minimal-inhibitory-concentration

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### OBJECTIVE

To control bacterial spore germination during tobacco processing and storage by developing an integrated biocontrol system.

### STATUS

After evaluation in tobacco extracts, D-alanine was tested on ML cut filler. Optimal conditions favoring germination of the natural tobacco microflora were defined. D-alanine efficiency was evaluated and the minimal inhibitory concentration was established.

### RESULTS

Until now, D-alanine used to be evaluated in tobacco extracts and SEL against *Bacillus pumilus* spores isolated from the tobacco [1].

*Bacillus* spores do not germinate spontaneously on the tobacco under conditions encountered at equilibrium during the process. A procedure was developed to evaluate D-alanine directly on tobacco [2]. Fig. 1 shows the relation between tobacco water activity (AW) and spore germination after incubation at 37°C. At AW 0.98, 60 % of the population had germinated after 16 hours, while no germination occurred at AW 0.90.

D-alanine efficiency was evaluated on cut filler equilibrated at AW 0.98. Fig. 2 presents the dose-response curve. The minimal inhibitory concentration found was around 200 ppm, which is in agreement with results obtained previously in tobacco extracts [3].

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### PLANS

Complete the evaluation of D-alanine on tobacco.

### REFERENCES

- [1] Kaelin-P. and Hofer-M., Quarterly Report, Project Europ, January-March 1989.
- [2] Berney-J. and Hofer-M., Quarterly Report, Project Galaxy, January-March 1990.
- [3] Kaelin-P. and Hofer-M., Final report "Biocontrol of tobacco microflora by D-alanine", July 1990.

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Figure 1 : SPORE GERMINATION AS FUNCTION OF  
CUT FILLER AW

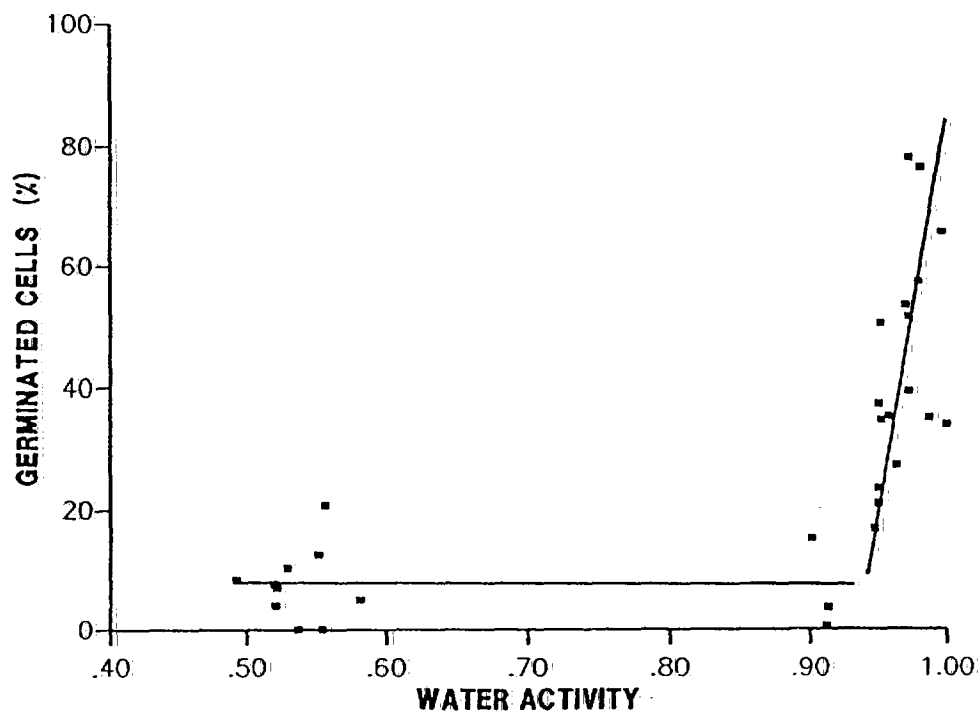
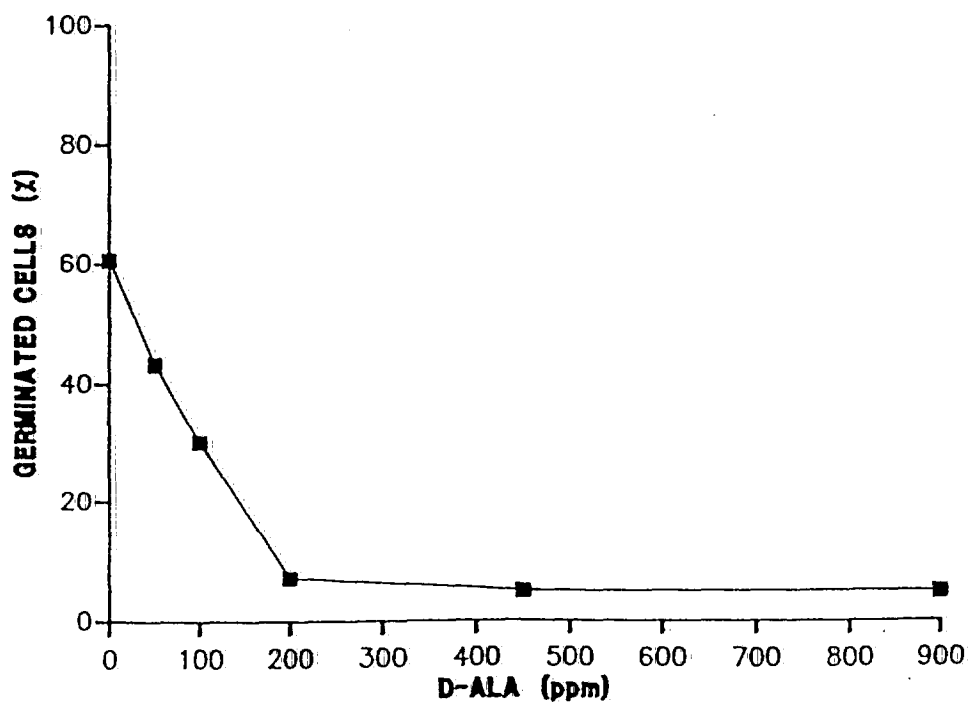


Figure 2 : EFFECT OF D-ALANINE ON SPORE GERMINATION  
ON CUT FILLER AT AW=0.98



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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : PHOEBUS  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Kälin-P. (PAK)  
KEYWORDS : tobacco-identical, preservative, bacillus,  
spore, germination, inhibition, gel-  
filtration, isolation, purification, non-  
polar, extraction, filtration

---

### OBJECTIVE

Identify and evaluate tobacco-identical substances able to block specifically the microbiological activity of tobacco microflora.

### STATUS

As the BCD-polymer was not appropriate to isolate specifically inhibitory compounds from Oriental tobacco extracts, other solid phase extractions were selected [1].  
Procedures using gel-filtration and nonpolar phase chromatography were developed.

### RESULTS

Concentrated Oriental tobacco extracts were extracted on Sephadex G-10 (Pharmacia) and on modified silica (RSiL C18 LL, Chemie Uetikon) columns. Fractions were collected, concentrated to the initial sample volume and their inhibitory capacity measured in cut filler medium [1].  
The inhibitory principle was retained on both columns. For Sephadex G-10 filtration, no inhibitory effect could be recovered at this time, either in fractions corresponding to main peaks absorbing in UV (Fig. 1), nor in the total eluate reconcentrated. After non-polar phase extraction, however, a strong germination inhibition was measured from methanolic eluate, after the matrix was washed with water.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### PLANS

- Analyse the methanolic fraction after nonpolar phase extraction.
- Continue investigation to recover preservative effect from gel filtration.
- Develop a procedure using multiple sorbents in order to improve isolation and purification of inhibitory compounds.

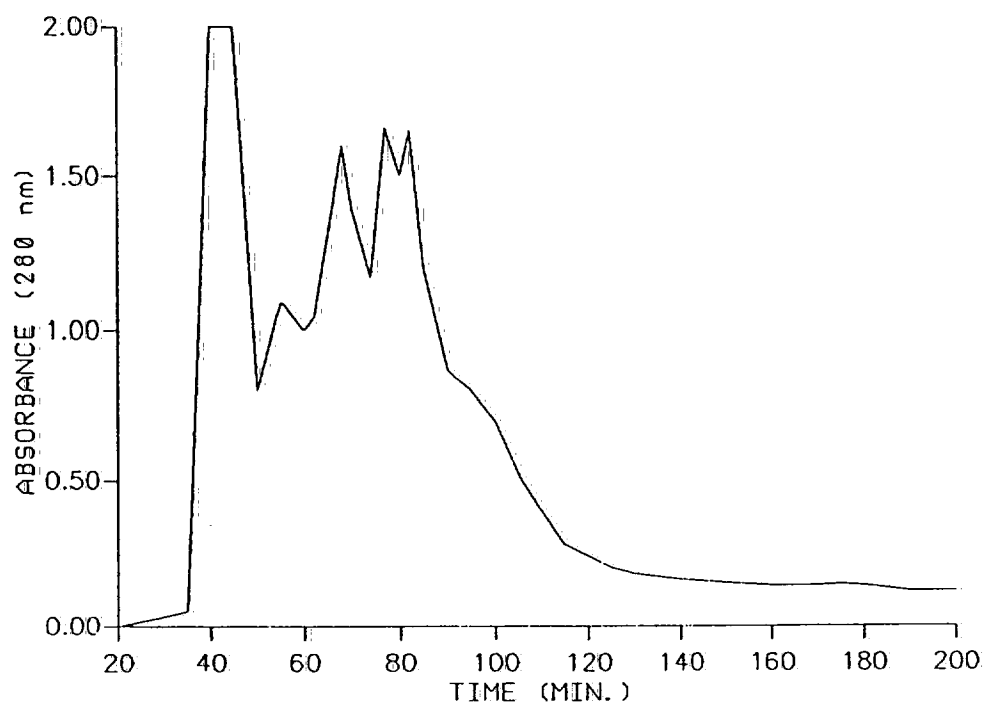
### REFERENCE

- [1] Kälin-P., Quarterly Report, Project PHOEBUS, January-March 1990.

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Figure 1 : GEL FILTRATION OF ORIENTAL EXTRACT  
ON SEPHADEX G-10



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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : IVORY  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Berney-J. (JBE)  
KEYWORDS : ivory-coast, senegal, taste, shipping, bbs,  
temperature, tracer, record, case, container,  
bacteria

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### OBJECTIVES

- Investigate the reasons for subjective differences in ML cigarettes produced in Ivory Coast (Bouake) and Senegal (Dakar) from the same Basic Blend Strips (BBS) shipped from Richmond.
- Monitor BBS shipment and storage conditions from production to processing in respective primaries.
- Study the impact of local tobacco processing on microbiological and chemical composition as well as subjective quality of final products.

### STATUS

Tobacco temperature was recorded during BBS shipment and storage for both destinations.  
Microbial situations were profiled before and after shipment and storage as well as during tobacco processing in respective factories.

### RESULTS

#### Temperature

Tobacco sample cases with temperature recorders were loaded in bottom, middle and top of 40 containers [1].  
For both destinations, temperature profiles can be divided into four parts : storage between BBS production and loading of containers, shipment between USA and destination port, transfer from port to factory warehouse, and storage in warehouse until trial lay down [2].  
Figs. 1 and 2 present BBS temperature profiles in cases from

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

middle and top of the containers for Ivory Coast and Senegal. After BBS production, tobacco temperature decreased from 35-40°C to 20°C before shipment. During shipment, tobacco temperature varied only slightly for the cases in the middle of the containers. Temperature variations however were observed in cases on the top. More particularly for Ivory Coast, temperature increased from 20 to 30°C and day/night cycles were recorded. As containers were unloaded and stored in Abidjan for two weeks, the amplitude of daily variations reached 7°C. In Senegal factory warehouses, tobacco temperature varied from 25 to 20°C and then back to 25°C within the three months' storage. The overall temperature in Ivory Coast warehouses remained relatively constant around 30°C, but cyclic variations were still recorded.

### Microbiology

Figs. 3 and 4 summarize microbiological situations during both BBS shipments.

Total bacterial counts (CFU = Colony Forming Units) were around  $1.4 \times 10^6$  per gram BBS after production in Richmond. The population was reduced by more than half ( $0.6 \times 10^6$ ) during shipments. This reduction continued during storage in local warehouses as well as during tobacco processing, to finally reach a total bacterial count of  $0.5 \times 10^5$  in the final cut fillers. The bacterial population of BBS after production was reduced by a factor of 30 during shipment, storage and cigarette manufacturing in Senegal and Ivory Coast. The proportion of dormant spores remained relatively constant throughout the tests at around 60%. No significant differences could be found between samples taken from cases loaded in the bottom, middle or top of the containers.

### CONCLUSIONS

Temperature differences were observed between BBS shipments to Ivory Coast and Senegal. Day/night variations were recorded during the Ivory Coast shipment and storage in Abidjan port for cases loaded at the containers' edge.

During the storage in factory warehouses, daily temperature variations were also measured in Ivory Coast and the average temperature was 5°C above that of Senegal.

Tobacco microbiology was similar during both tests, with a drastic reduction of the bacterial population.

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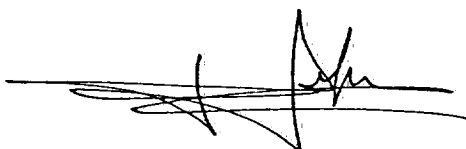
## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### PLANS

A final report including results from subjective evaluations is in preparation.

### REFERENCES

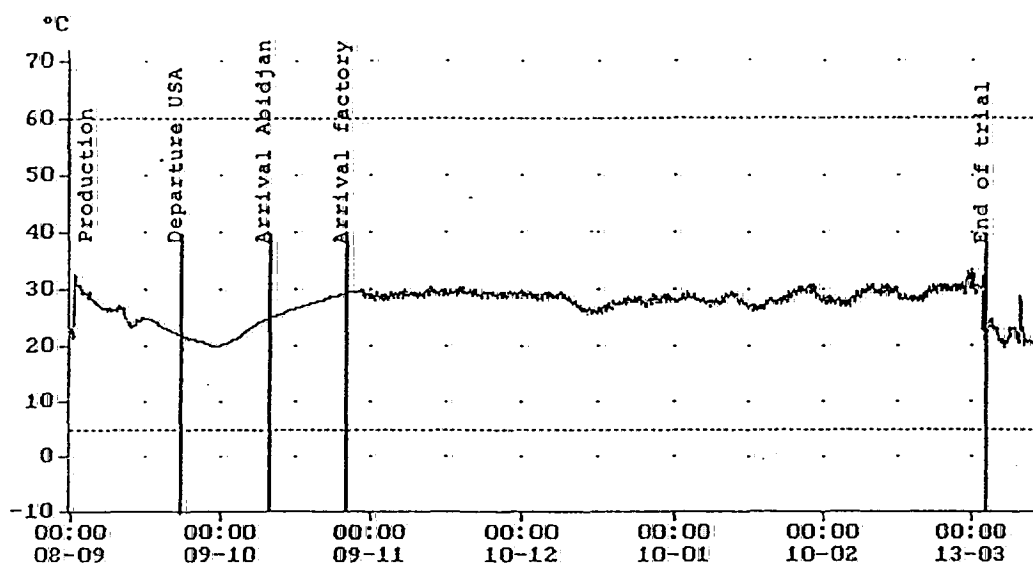
- [1] Memo from Roer-W. to Buttica-B., August 16, 1989.
- [2] Profs note from Roer-W. to Berney-J., May 22, 1990.

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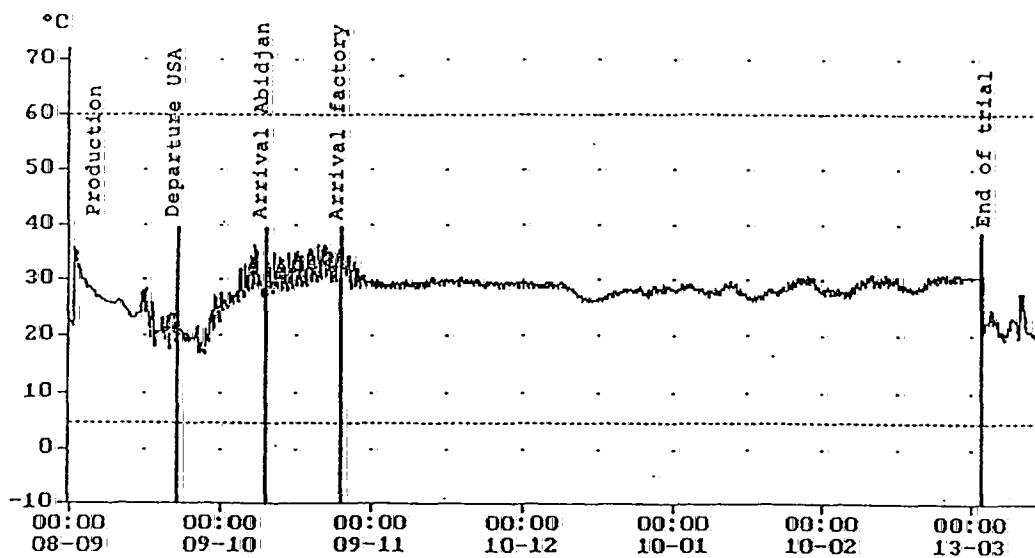
Figure 1 : BBS TEMPERATURE PROFILE  
IVORY COAST

Middle:



Time - Date

Top:

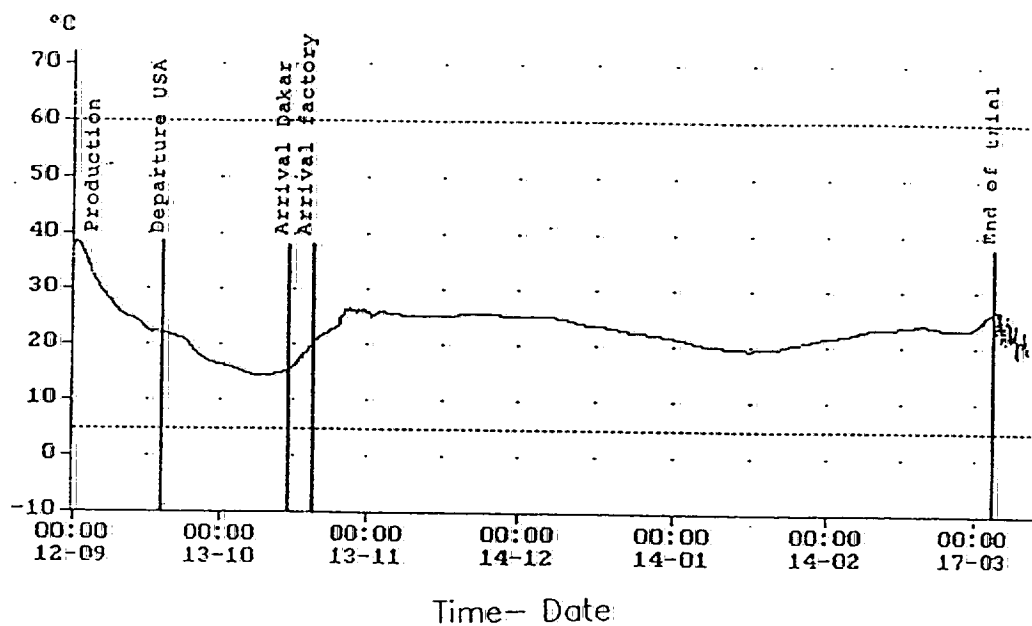


Time- Date

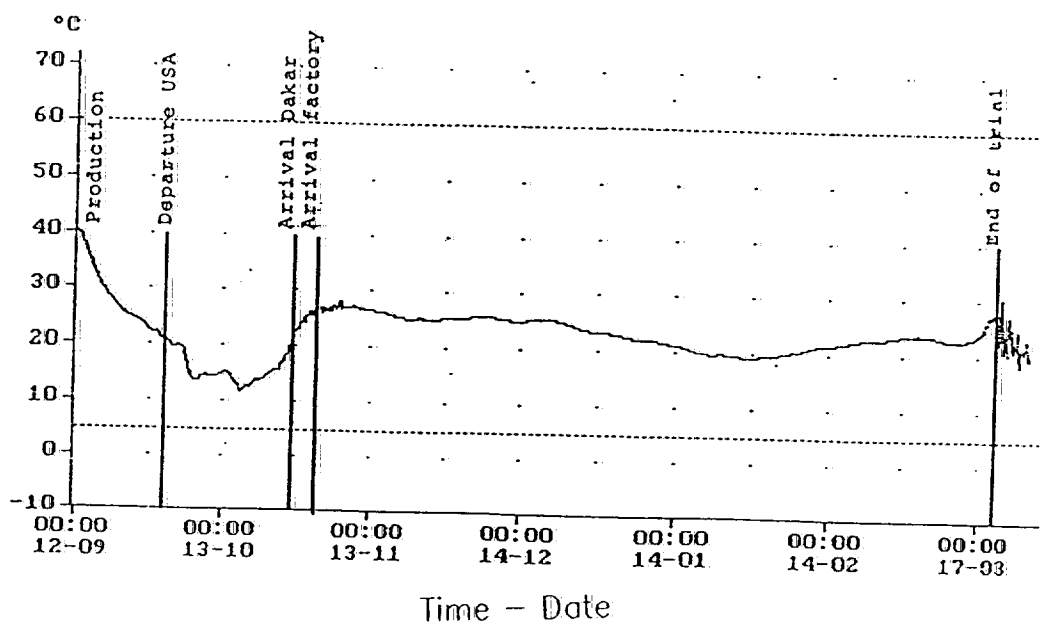
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Figure 2 : BBS TEMPERATURE PROFILE  
SENEGAL

Middle

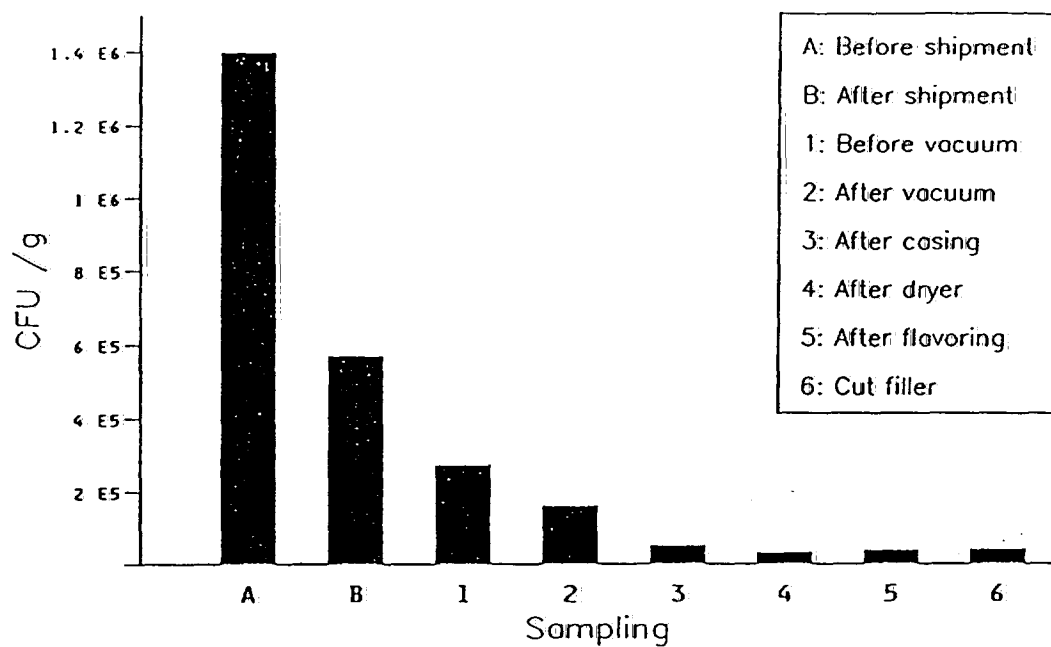


Top

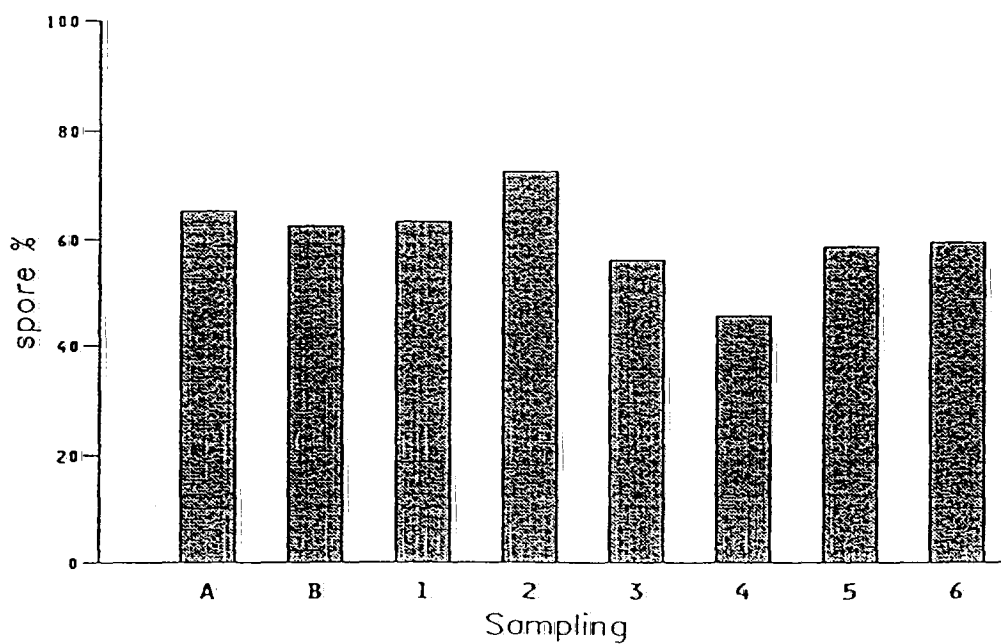


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Figure 3 : BBS SHIPMENT IN IVORY COAST  
Total Bacterial Count

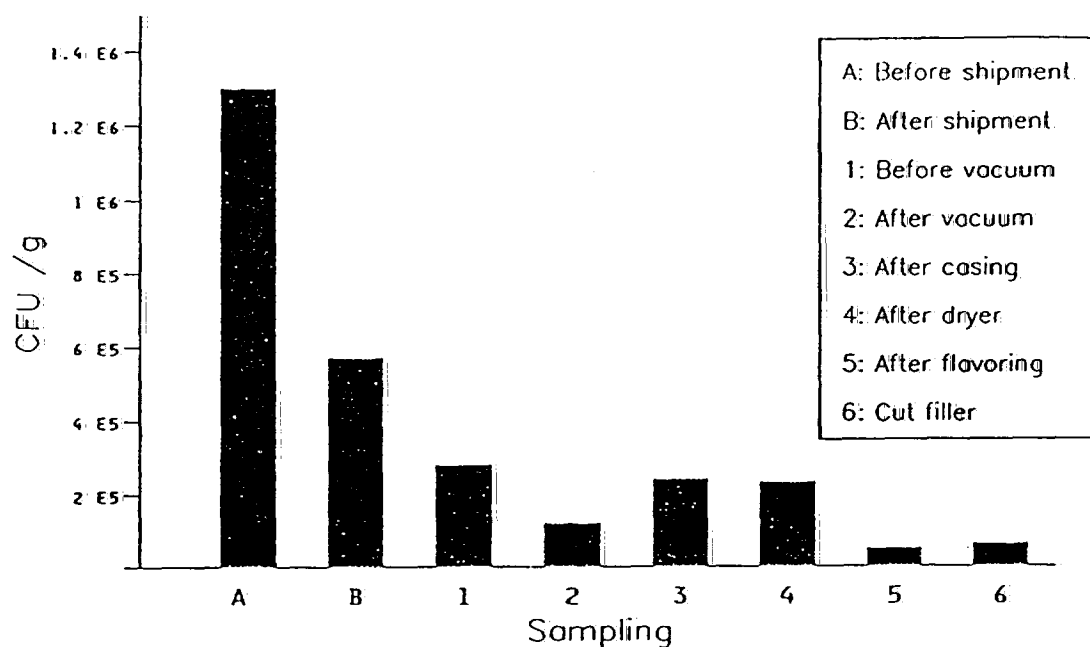


BBS SHIPMENT IN IVORY COAST  
Dormant Spore Proportion

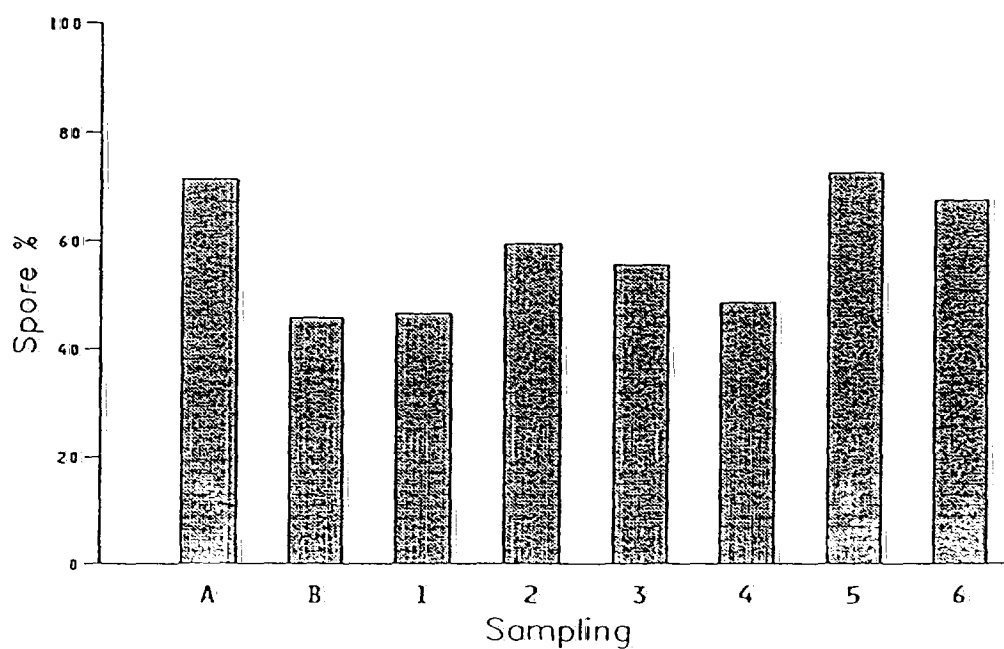


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Figure 4 : BBS SHIPMENT IN SENEGAL  
Total Bacterial Count



BBS SHIPMENT IN SENEGAL  
Dormant Spore Proportion



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## RESEARCH AND DEVELOPMENT, NEUCHÂTEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : PESTICIDES  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Amati-D. (DAA)  
KEYWORDS : culture, moon, saturn, methoprene, tla,  
coresta, maleic-hydrazide, mh-30,  
dithiocarbamate, dtc, flumetralin, thiram

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### OBJECTIVES

To provide an analytical service for the analysis of pesticides in tobacco and cigarette filler.

To develop analytical methods for new pesticides and to improve existing methods.

### RESULTS

#### Project CULTURE

- Methods  
A method for the determination of 2,4-D, 2,4,5-T and dicamba in tobacco was written up [1]. The revised methods for the determination of various pesticides in tobacco (GPC-GC) and for the determination of methoprene in tobacco were rewritten [2,3].
- Flumetralin  
The final manuscript for the determination of flumetralin in tobacco was prepared and sent out for publication.
- Methoprene  
Five tobacco dust samples from trials with Dianex collected at FTR factory were analysed for methoprene. Residues ranged from 1.7 to 22.1 ppm [4].  
Three tobacco samples from Coresta joint-experiment 29 were analysed for methoprene. Two samples contained 1.9 and 5.5 ppm respectively. No methoprene was detected in the third sample (i.e. < 0.5 ppm).
- Maleic hydrazide  
At the request of Leaf Department EEC, 8 US-FC crop 89 and 2 US-BU crop 89 samples were analysed for MH-30 [5,6]. All

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

US-FC samples had MH-30 residues above 80 ppm.

Eighteen PMH, 38 FTR, 13 PM-EEC and 2 PMB-TLA samples were analysed for MH-30 [7-11]. Thirty eight samples had MH-30 residues above 80 ppm.

- Dithiocarbamates  
OR-tobacco samples from various origins (GR, TU, IT, YU, TH), as well as PM and competitor brands from IT, were analysed for dithiocarbamates. Residues in the OR samples ranged from not detectable (< 0.7 ppm) to 50 ppm. In the PM brands, residues were found between n.d. and 6 ppm and in the competitor brands, between n.d. and 24 ppm [12-14].

### Project MOON

- PMG-TLA samples and PMG-brands  
As an analytical service for PMG, 103 TLS samples and 14 PMG-brands were analysed for pesticide residues [15-17]. Eleven TLA samples had MH-30 residues exceeding 80 ppm, and 1 sample (BU-IN) had a DDT residue above the 10 ppm max. permissible value. EDB residues were found in 12 samples. In the PMG-brands, no pesticide residues above the German tolerances were found. Dithiocarbamate residues ranged between 0.4 and 6.6 ppm and those for MH-30 between 5.3 and 54.4 ppm. Compared to the last quarterly check, lower MH-30 residues were found in PMU-Berlin and CEG-Berlin (54.4 ppm and 27.7 ppm respectively against 78.9 ppm and 47.4 ppm respectively).

### Project SATURN

At the request of PM-AS, 3 Bright leaf samples were analysed for pesticides. Two samples had MH-30 residues above 80 ppm [18].

### Method development

- Thiram  
In the context of problems with dithiocarbamate residues on OR tobacco, a method for the determination of thiram (bis dimethylthiocarbamoyl-disulfide) is under development. The principle of the method involves the extraction of thiram from tobacco with  $\text{CHCl}_3$  followed by a subsequent HPLC separation with postcolumn derivatization and UV detection.

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

REFERENCES

- [1] Determination of 2,4-D, 2,4,5-T and Dicamba residues in tobacco (GC method), Amati-D., May 1990.
- [2] Determination of various pesticides in tobacco (GPC-GC method), Amati-D., May 1990.
- [3] Determination of methoprene in tobacco (GC method), Amati-D., May 1990.
- [4] Memo from Amati-D. to Freymond-J.M., May 23, 1990.
- [5] Memo from Amati-D. to Pocket-C., April 23, 1990.
- [6] Memo from Amati-D. to Pocket-C., April 27, 1990.
- [7] Memo from Amati-D. to Orsan-G., March 1990.
- [8] Memo from Amati-D. to Orsan-G., April 9, 1990.
- [9] Memo from Amati-D. to Orsan-G., April 27, 1990.
- [10] Memo from Amati-D. to Orsan-G., May 21, 1990.
- [11] Memo from Amati-D. to Orsan-G., May 22, 1990.
- [12] Memo from Bourlas-M. to Speck-M., March 30, 1990.
- [13] Memo from Speck-M. to Bourlas-M., April 4, 1990.
- [14] Memo from Speck-M. to Bourlas-M., June 22, 1990.
- [15] Memo from Amati-D. to Probst-K., May 3, 1990.
- [16] Memo from Amati-D. to Probst-K., May 22, 1990.
- [17] Memo from Amati-D. to Probst-K., May 31, 1990.
- [18] Memo from Amati-D. to Wajntraub-J., June 6, 1990.

27. 7. 90 *M. Speck*

2028634460

## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : HUMECTANT  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Renaud-J.M. (JMR)  
KEYWORDS : humectant, humectant-survey, germany, sorbitol

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### OBJECTIVE

To perform a regular survey on the use of humectants in brands in the EEC and EEMA regions (Project AQUARIUS).

### STATUS

The leading DB brands bought on the market in June 1990 were analysed for glycerin, propylene glycol, sorbitol, 1,3-butanediol and mono-, di- and triacetine [1]. Glycerin, propylene glycol and sorbitol were found. Their respective amounts are listed in Table 1. Analytical results obtained from December 1987 to June 1990 are illustrated in the attached figures.

As compared to the last survey [2], a reduction of glycerin from 2.3 to 0.9% is observed for Camel. This reduction is compensated by an increase of propylene glycol from 0.6 to 1.6%. No sorbitol was detected after 0.4% in December 1990.

Marlboro remains now the only brand within the leading DB brands with a high glycerin content of above 2%.

The humectant content of the other brands is in line with the values reported previously for glycerin, propylene glycol and sorbitol. For HB, the decrease in glycerin as observed in December 1989 is confirmed.

### REFERENCES

- [1] Memo from Renaud-J.M. to Fink-W., July 6, 1990.
- [2] Memo from Renaud-J.M. to Speck-M., December 21, 1989.

*Renaud*

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TABLE 1: HUMECTANT CONTENT OF GERMAN BRANDS [%] (June 1990)

Brand name	Size	GLY	Humectant PG	Sorbitol
Marlboro Box	84/F	3.0	1.4	n.d.
HB Kronenfilter	84/F	0.2	2.5	1.0
Camell	84/F	0.9	1.6	n.d.
Peter Stuyvesant	84/F	0.2	1.6	0.2
Lord Extra	84/F	0.2	1.3	n.d.
West	84/F	0.2	1.6	n.d.
Ernte 23	84/F	0.2	1.7	n.d.
R 6	84/F	0.2	1.8	1.2
Reval	77/NF	0.2	1.9	n.d.
Prince Denmark	84/F	-	-	-

n.d. = not detectable (detection limit 0.1 %)

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TABLE 1: HUMECTANT CONTENT OF GERMAN BRANDS [%] (June 1990)

Brand name	Size	Humectant		
		GLY	PG	Sorbitol
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HB Kronenfilter	84/F	0.2	2.5	1.0
Camel	84/F	0.9	1.6	n.d.
Peter Stuyvesant	84/F	0.2	1.6	0.2
Lord Extra	84/F	0.2	1.3	n.d.
West	84/F	0.2	1.6	n.d.
Ernte 23	84/F	0.2	1.7	n.d.
R 6	84/F	0.2	1.8	1.2
Reval	77/NF	0.2	1.9	n.d.
Prince Denmark	84/F	-	-	-

n.d. = not detectable (detection limit 0.1 %)

- = not analysed

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FIG. 2 PROPYLENE GLYCOL CONTENT OF GERMAN BRANDS (1987-90)

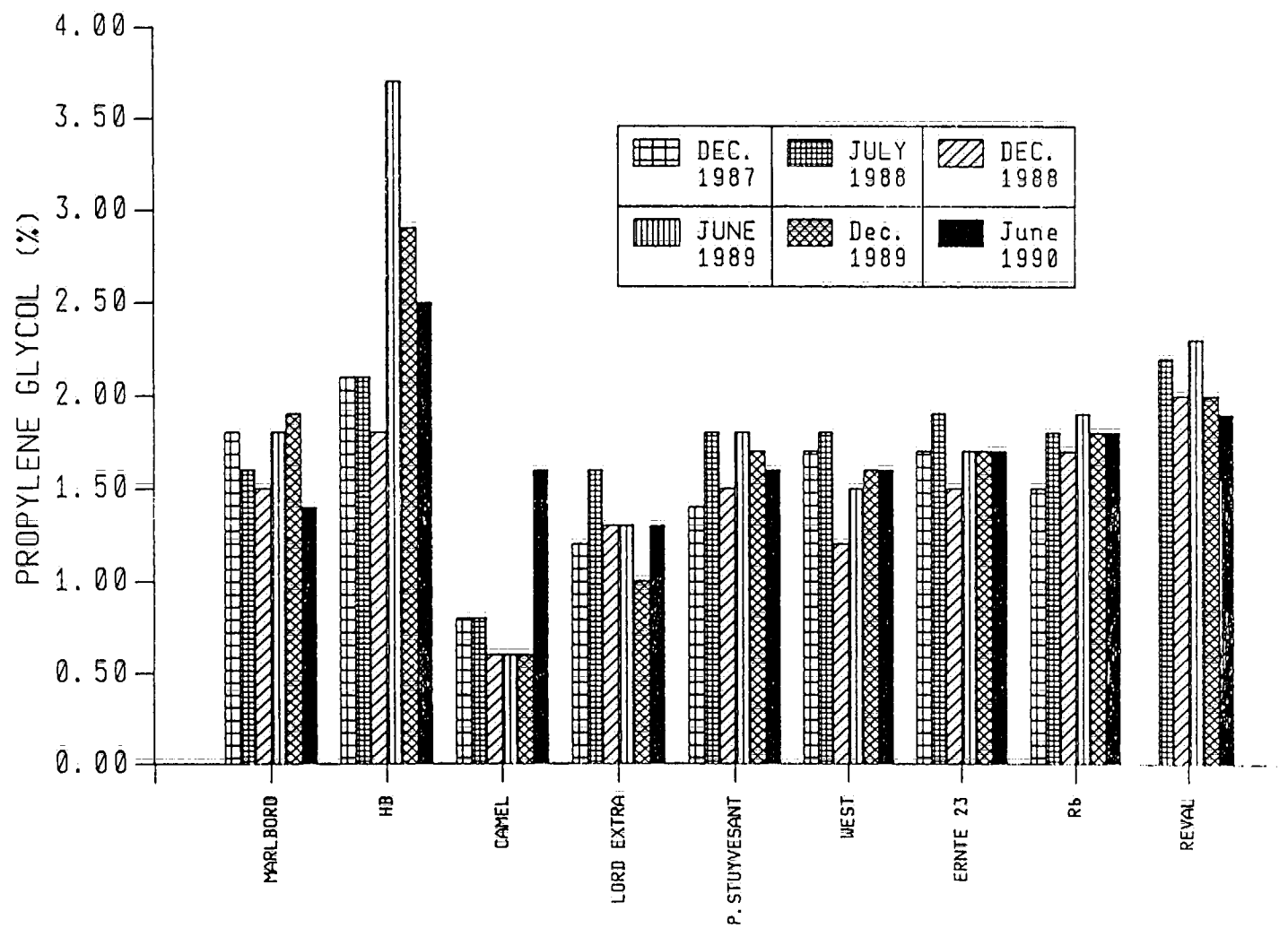
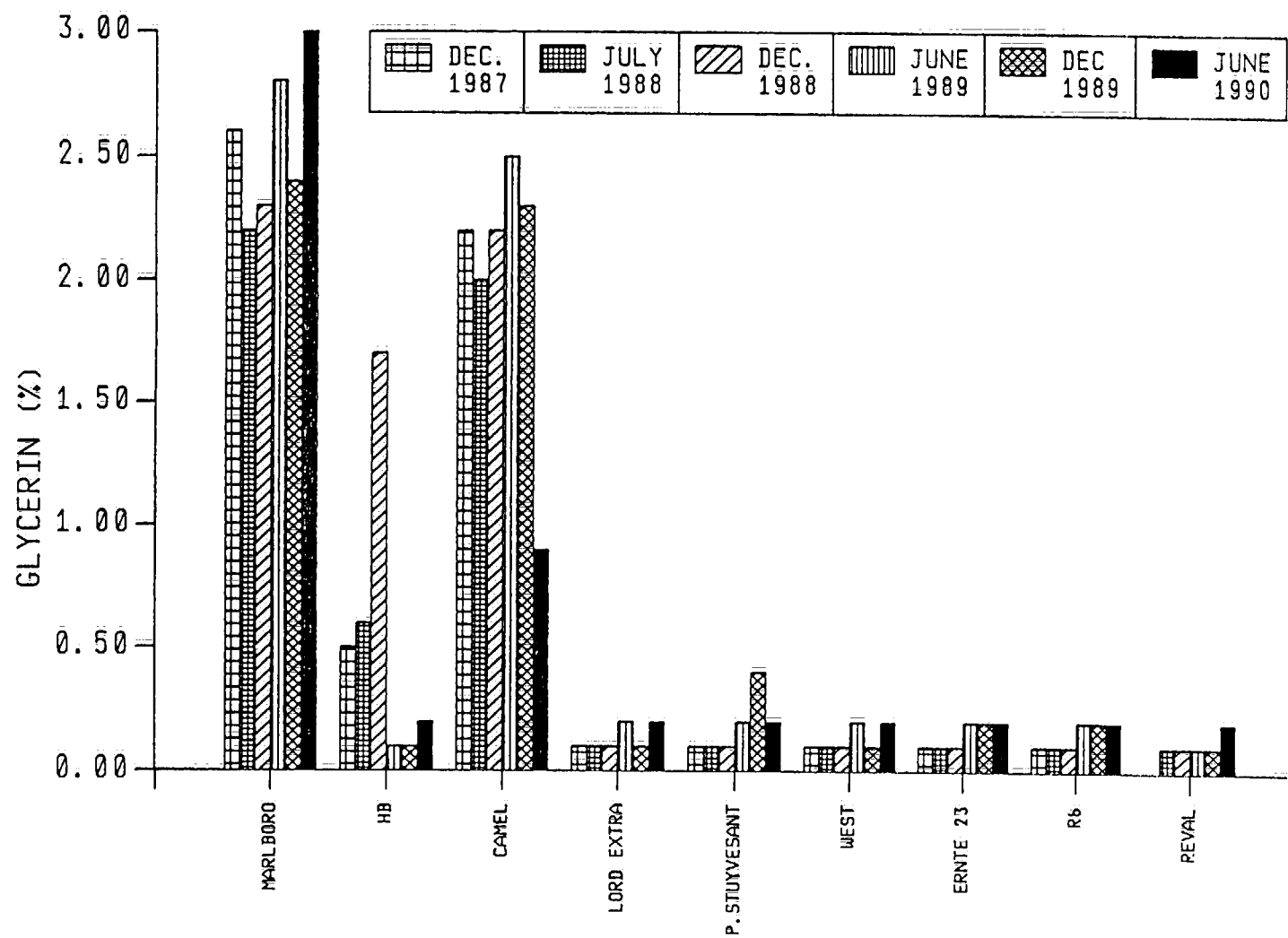


FIG. 1 GLYCERIN CONTENT OF GERMAN BRANDS (1987-90)



RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : DEIMOS  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Bindler-G.N. (GNB)  
KEYWORDS : ss, single-cigarette, nicotine, water,  
analysis.

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OBJECTIVE

Develop and evaluate the methodology for the single cigarette routine determination of sidestream smoke yields.

STATUS

Equipment

The existing sidestream smoke (SS) collection system based on a four-port Borgwald smoking machine was further equipped with an automatic flow control system. A MKS 1259 mass flow meter with feed-back flow control was incorporated in each channel. This device has a fast response time and assures an excellent stability and repeatability of the air flow during the smoking run of the cigarette.

Method

In order to perform all nicotine and water analyses by GC in our laboratory, the suitable equipment had been set-up. To validate our procedures, all samples (both MS and SS) obtained from 6 smokings of IM13 monitor cigarettes were simultaneously analyzed by flow injection analysis in the smoking laboratory and by our GC method. No statistically significant bias was found when comparing the results obtained by both methods, and the precisions were also quite similar.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### Analytical determinations

On request from Product Development, 4 prototypes from project Novelties [1], 4 prototypes from project Niles [2] , 5 prototypes from project Chisel [3] and 4 miscellaneous prototypes [4] were analysed for nicotine, tar and carbon monoxide. Eleven brands from the Swiss market were analysed [5].

### PLANS

Adaptation of the SS collection system to routinely monitor the benzene and toluene yields will be implemented.  
Further market survey will be done.

### REFERENCES

- [1] Memo from Bindler-G. to Braem-D., May 1, 1990.
- [2] Memo from Bindler-G. to Gawad-A., June 26, 1990.
- [3] Memo from Bindler-G. to Badertscher-T., May 1, 1990.
- [4] Memo from Bindler-G. to Braem-D., May 1, 1990.
- [5] Memo from Bindler-G. to Fink-W., June 22, 1990.



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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : SS-DETERMINATION  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Pestlin-S. (SAP)  
KEYWORDS : atlas, ozone, ss-gas-phase, fid, neptune,

---

### OBJECTIVES

To investigate the formation mechanism of SS parameters and to measure SS yields.  
To develop analytical methods for SS parameters and to improve actual ones.

### RESULTS

#### Method development (projects ATLAS, NEPTUNE)

##### - Determination of SS ozone (ATLAS)

In order to confirm that the ozone analyser measures ozone in SS and not other compounds that interfere with the measurement, SS was sampled with Dräger tubes. Ozone could not be detected and its concentration should therefore be below 50 ppb for three cigarettes, if present.

To investigate if the reading of the ozone analyser is influenced by SS particles, different filter materials with pore sizes from 5  $\mu\text{m}$  (original filter) to 0.2  $\mu\text{m}$  were used. It was shown that filters made of teflon or polyvinylidene difluoride do not react with ozone, and that the smaller the pore size, the lower the ozone instrument reading. At a pore size of 0.22  $\mu\text{m}$ , where no further interference of particles is expected, the instrument reading was still  $\sim 70$  ppb for 3 cigarettes, and above the detection limit of the Dräger tubes (50 ppb). However, ozone was not detected. Therefore, the possible interference of the following SS components on the measurement was investigated: NO, NO<sub>2</sub>, CO, CO<sub>2</sub>, benzene, water, formaldehyde, acetaldehyde and isoprene. No influence of these compounds on the O<sub>3</sub> instrument reading, either with or without smoke was observed.

Using an impinger containing water or an Extrelut tube coated with water at the inlet of the O<sub>3</sub> analyses, and sampling SS through them, a zero reading was obtained which shows, instead of ozone, a compound which is either soluble in

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

water or decomposed by water.

Status

Smoking 3 cigarettes, no ozone was detected in SS using Dräger tubes. If ozone is present in SS, its concentration is smaller than 15 ppb per cigarette.

When excluding particles from SS, the analyser reading is 20 ppb per cigarette. This value is probably not due to ozone and the common SS parameters.

Plans

The effect of ozone on SS and on the instrument reading will be further investigated.

- Determination of SS gas-phase hydrocarbon (NEPTUNE)

Prototypes of projects CALYPSO (various cigarette wrappers) and TRITON (single component cigarettes) were smoked in the experimental room in order to determine hydrocarbon concentrations. Only minor differences in hydrocarbon concentrations between all prototypes were observed. A correlation between gas phase and particle phase was not found.

S. Pirelli

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : HYDRA - ETS  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Gerber-C. (CAG)  
KEYWORDS : ets, poldi

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PROJECT HYDRA  
=====

OBJECTIVE

Obtain an analytical data-base on ETS through indoor air monitoring experiments.

STATUS

Complement of POLDI project

An ETS survey based on controlled but realistic smoking sessions was performed. Merging its results with those from project POLDI [1] and some single-cigarette sidestream yield determinations [2] will provide the experimental data for preparing a paper entitled "Influence of environmental conditions and smoke dilution on the measured levels of ETS components" [3].

To this effect 30 smoking sessions were performed in an office of the R&D building. Two experimental cigarettes (C20 and C50) [1] were studied. Smoking was performed both by humans and by machine.

The rate of room air exchange was varied.

Most experiments consisted in measuring the initial concentration and the decay rate of a series of ETS components following the simultaneous smoking of 2 to 4 cigarettes. In addition, several sessions were performed where the ETS concentration was kept at a steady level by maintaining a constant smoke generation rate. In those experiments, sampling times could be extended to as long as 5 hours, and extremely low detection limits can be achieved.

The aim of this study is to point at the inherent difference that prevails between sidestream smoke and ETS, and in particular to criticize some modelisations of ETS exposure that provide grossly inflated results [4].

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## RESEARCH AND DEVELOPMENT, NEUCHÂTEL - QUARTERLY REPORT

### PROJECT ETS

#### OBJECTIVE

Support S&T in the organisation and supervision of sub-contracted studies on ETS; test the analytical procedures of these external laboratories through collaborative studies.

#### STATUS

Collaborative study with the Institut für Biopharmazeutische Microanalytik (Dr G.B. Neurath, Hambourg). The method for measuring nicotine in air which is used by this institute was tested following their recommendations. The analysis of spiked sampling tubes will be performed as soon as they are received. It is already clear that this method is more cumbersome and less precise than the one proposed by the CORESTA Task-Force [5].

#### Iso-ion air-cleaner

An intermediate report providing an estimation of ETS gas and particulate phase elimination by the "Iso-ion" air cleaner was issued. Completion of this study was delayed for priority reasons [3].

#### PLANS

- Finalize the POLDI follow-up and submit a paper for publication.
- Finalize the Iso-ion air-cleaner estimation.
- Finalize the on-going collaborative studies.
- Begin the environmental monitoring of volatile organic compounds.

#### REFERENCES

- [1] Blake-C.J. and Piade-J.J., Final report of Poldi Project, Quantitative Evaluation Of Cigarette Sidestream Smoke Under Controlled Experimental Conditions, Neuchâtel, May 1989.
- [2] Bindler-G., Method for single cigarette analysis, Method in preparation.
- [3] Gerber-C., Quarterly Report January-March 1990.
- [4] Repace-J.L., Indoor concentrations of environmental tobacco smoke : Models dealing with effects of ventilation and room size, International Agency for Research on Cancer, Vol. 9, Passive Smoking, 1987.

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- [5] Ogden-M.W. and Conner-J.M., Methods for Nicotine, Respirable Suspended Particles and Ultraviolet Particulate Matter in Environmental Tobacco Smoke : Collaborative Study, presented at the 41st Tobacco Chemists' Research Conference, Oct. 4-7, 1987, Greenboro NC.

*C. Gerber*

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : ORDER  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Murray-M. (MUM)  
KEYWORDS : regulation, db, flavor, preservative,  
analysis, compliance

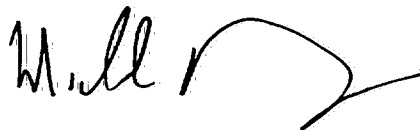
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OBJECTIVE

To ensure that PM produced materials and products comply with the requirements of the German Food Law.

STATUS

A further series of samples has been received from PMG.  
Analytical work is in progress.



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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH  
SUBJECT TITLE : PACK  
PERIOD COVERED : April - June 1990  
WRITTEN BY : Lauper-G. (GLA)  
KEYWORDS : pack, label, cardboard, profile, ink, solvent,  
volatile, flavor, odor, organoleptic,  
sniffing, packaging, headspace, quality

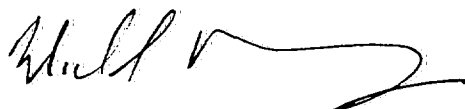
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OBJECTIVE

To determine which substances in packaging materials adversely influence cigarette taste, and establish maximum acceptance levels.

STATUS

The acceptance levels established by project PACK and the analytical method were presented to SICPA. Methods and levels were discussed.



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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : RESEARCH

SUBJECT TITLE : ANALYTICAL INVESTIGATIONS

PERIOD COVERED : April - June 1990

WRITTEN BY : Murray-M. (MUM), Lauper-G. (GLA), Moor-Ph. (PHM), Renaud-J.M. (JMR),

KEYWORDS : label, profile, board, carton, tip, solvent, coating, off-taste, gravure, offset, varnish, taste, cj, ch, db, eg, es, fr, ic, it, us, twine

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### PACKAGING ANALYSIS

Battistoni HL blanks and display carton printed by Rentsch with a high-gloss varnish ex Aarberg were well within solvent tolerances [1] (GLA).

Samples of Lorilleux inks and varnishes, boards and printed blanks, were received for analysis. The varnishes and inks contained some strongly smelling solvents. Panel testing was recommended [2] (GLA/PHM).

A Belmont HL blank ex Ahlström contained a higher amount of 1-methoxy-2-propanol than permitted by PM tolerances. Calibration solutions were sent to Ahlström to improve their application of the PM analytical method [3] (GLA).

The principal component of a high-gloss varnish from Sicpa was identified as dipropylene glycol monopropyl ether [4,5] (GLA/PHM).

New acrylic copolymer and PVA pack glues had a more pronounced odor than current material. Several undesirable substances were identified by GC-MS [6,7] (GLA/PHM).

A sample of Iggesund T board contained 4-cyanocyclohexene and 4-phenylcyclohexene which have been previously found on "off odor" samples [8,9] (GLA/PHM).

Printing trials to introduce new odor standards with Amer Tuppaka produced acceptable HL blanks ex Europack [10,11] (GLA).

Aticarta produced MLB HL blanks for PMG Munich. The samples were within PM tolerances but some had an odor which was traced to a series of aromatic hydrocarbons from a Sicpa varnish. The reason for the odor was discussed with Sicpa [12,13] (GLA/PHM).

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

Offset-printed labels from Graphia contained some butoxyethanol. Helio-printed blanks from Field were within tolerance [14,15] (GLA/PHM).

Further samples of Iggesund board again showed large peaks of 4-cyanocyclohexene and 4-phenylcyclohexene. Hexanol peaks were similar to the standard product [16,17] (GLA/PHM).

A sample of MLF HL ex Romero was greatly improved relative to previous production. However, ethoxypropanol and toluene were slightly above tolerances [18,19] (GLA).

Analysis of varnish ingredients supplied by Sicpa showed a number of high odor substances. Reformulation was suggested [20] (GLA/PHM).

MLK labels ex Tilgnam were within tolerances except for slightly high levels of methoxy- and ethoxypropanol [21,22] (GLA).

HL blanks from Romero and Rentsch for PM Spain were analysed. All samples were outside PM tolerances [23,24] (GLA).

### TWINE

A twine used for tobacco bales was shown to be polypropylene [25] (MUM).

### SERVICES FOR OTHER GROUPS

#### Puff by puff smoking

Upon request of Product Development, 10 VOLGA prototypes were analysed for puff by puff DPM, nicotine and CO [26].

#### CF analyses

Cigarettes from Sweden [27] and Denmark [28], sampled between February and April 1990, were analysed for CF. As compared to the last CF survey [29], CF was removed from the brands sold in Denmark and only small amounts (1.5 ppm) were detected on Prince of Blends KS and Prince of Blends Light.

In Sweden, the CF content was decreased in Camel 69/NF from 34 to 10 ppm and removed completely from Dunhill Special Light, John Silver KS, Prince, Right and Salem Light Menthol.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

At the request of Product Development, CF was analysed in Camel Box 84/F, Camel Soft 84/F and Winston Box 84/F from the Swiss market. No CF was detected in May [30] in any brands while 5.5 ppm were detected again in Camel 84/F Soft in June [31].

### Headspace analyses

Upon request of Environmental Research, 14 samples corresponding to ambient air sampling were analysed for HCN by headspace gas chromatography [32].

### REFERENCES

- [1] Memo from Lauper-G. to Gabler-E., April 6, 1990.
- [2] Memo from Lauper-G. to Lutzig-B., April 23, 1990.
- [3] Memo from Lauper-G. to Gabler-E., April 25, 1990.
- [4] Memo from Gabler-E. to Lauper-G., May 8, 1990.
- [5] Memo from Lauper-G. to Gabler-E., May 15, 1990.
- [6] Memo from Lutzig-B. to Lauper-G., May 7, 1990.
- [7] Memo from Lauper-G. to Lutzig-B., May 14, 1990.
- [8] Memo from Gabler-E. to Lauper-G., May 21, 1990.
- [9] Memo from Lauper-G. to Murray-M., May 21, 1990.
- [10] Memo from Gallimore-P. to Kursteiner-C., May 2, 1990.
- [11] Memo from Lauper-G. to Kursteiner-C., May 23, 1990.
- [12] Memo from Gabler-E. to Lauper-G., May 8, 1990.
- [13] Memo from Lauper-G. to Gabler-E., May 23, 1990.
- [14] Memo from Lutzig-B. to Lauper-G., May 9, 1990.
- [15] Memo from Lauper-G. to Lutzig-B., May 28, 1990.
- [16] Memo from Lutzig-B. to Lauper-G., May 16, 1990.
- [17] Memo from Lauper-G. to Lutzig-B., May 28, 1990.
- [18] Memo from Gabler-E. to Lauper-G., June 5, 1990.
- [19] Memo from Lauper-G. to Gabler-E., June 18, 1990.
- [20] Memo from Lauper-G. to Gabler-E., June 14, 1990.
- [21] Memo from Michaca-M. to Lauper-G., May 30, 1990.
- [22] Memo from Lauper-G. to Michaca-M., June 11, 1990.
- [23] Memo from Gabler-E. to Lauper-G., May 22, 1990.
- [24] Memo from Lauper-G. to Gabler-E., June 11, 1990.
- [25] Memo from Murray-M. to Blom-A., May 5, 1990.
- [26] Memo from Renaud-J.M. to Gawad-A., April 19, 1990.
- [27] Memo from Renaud-J.M. to Speck-M., April 25, 1990.
- [28] Memo from Renaud-J.M. to Mäder-D., June 22, 1990.
- [29] Renaud-J.M., Report CF-survey 1989, December 13, 1989.
- [30] Memo from Renaud-J.M. to Giller-C., May 23, 1990.
- [31] Memo from Renaud-J.M. to Giller-C., June 21, 1990.
- [32] Memo from Renaud-J.M. to Gerber-C., April 25, 1990.



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PROCESS DEVELOPMENT

RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : CARAVAGGIO  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Wagoner-R. (RWA), Frattolillo-A. (ANF)  
KEYWORDS : caravaggio, comas, puffing, expansion, et

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OBJECTIVES

=====

Development and evaluation of the Comas puffing process as a potential expansion process for cut filler.

STATUS

=====

Following the visits by Process Development personnel to Comas (Treviso, Italy) for inspection of their stem puffing process, it was decided that the process could have potential as an expansion process for cut filler. Thus, in week 22, this project was initiated to develop and evaluate the concept.

Two sets of trials were conducted at Comas (week 25) using Marlboro cut rag and ETNA feedstock from Bergen op Zoom. Each of the materials was conditioned to a range of moisture levels (20 - 50% OV) and run at corresponding processing temperatures to produce a final target moisture of 13% OV. One "special" test was conducted in which the Marlboro cut rag was conditioned to about 30% OV, followed by the addition of approximately 10% of rolled cut stems, also at 30% OV. The purpose of this test was to determine whether the system would possibly act as a dryer for the cut rag and as a puffing unit for the stem while the materials were in a blend.

For all of the tests, there were minor material flow problems (feeder design, moisture meter calibration) due to the fact that the system was designed for processing stem instead of filler. However, in general, the trials were conducted as designed. Currently, the processed materials have been returned to Neuchatel for analysis. Reference materials (Marlboro rag exit dryer, ETNA) were also obtained from Bergen op Zoom for comparison.

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

PLANS

=====

Complete physical, chemical, and subjective comparison of the Comas processed tobaccos versus the Bergen op Zoom references..

Based on the above results, make recommendations concerning further development/evaluations of the process.

*J. P. Wagon*

RWA/vag/July 6, 1990  
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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : CLAUDE  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Wagoner-R. (RWA), Frattolillo-A. (ANF)  
KEYWORDS : claudé, boz, capacity, primary, conditioning,  
dcc

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OBJECTIVES

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On-site assistance in the planning and production trial phases of Primary capacity increases in Bergen op Zoom, to meet forecasted production requirements.

STATUS

=====

On April 6, a meeting was held in BOZ to discuss the concept of processing a Marlboro blend (bright, burley, oriental, reconstituted tobaccos) through the Dickinson Direct Conditioning Cylinder of the independent ET line. The purpose of the trial was to determine the effectiveness of the DCC in conditioning the tobaccos compared to normal Primary processing through the vacuum conditioners, as well as the effect on the subjective quality of the cigarettes.

On-site assistance was provided during week 16, in developing the test design, including designation of processing parameters, detailing the sampling scheme, and assigning group responsibilities.

Also, during this week, a preliminary trial was attempted, to process reconstituted tobacco through the DCC. It was unsuccessful due to the inability of the slicer unit to properly slice the tobacco.

On May 11, the actual trial was conducted with two representatives of Process Development present. With the exception of the reconstituted tobaccos, the trial progressed smoothly. Again, there were significant problems slicing the recon, which were compensated for, only through the manual operation of the slicer unit. BOZ completed processing of the test and reference Marlboro blends without further difficulty.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

Cigarettes from the test were subjectively evaluated by Panel A. They stated, that for the test, "the taste is clean, open, and pleasant. It is somewhat softer than the reference as far as throat impact is concerned but overall, of very acceptable quality" (1).

In addition, in week 24, personnel from Process Development visited Comas to observe trials processing recon through their continuous conditioning system. This unit also had difficulty slicing the recon, but the problems appeared to be less severe than those encountered at BOZ.

### PLANS

=====

Bergen op Zoom will issue a report detailing the results of the trial.

Continue to provide assistance to BOZ per the above objective.

### REFERENCES

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- (1) E. De Borst, Profs note, May 31, 1990, Panel A dcc test on ml/blend

*J. R. Wagon*

RWA/vag/July 6, 1990  
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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : ET-PAN-EUROPE  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Wetzel-P. (PIW), Lüthi-N. (NIL)  
KEYWORDS : et, pan, europe, pmg. ftr, munich, onnens, boz, berlin, fire, technical, assistance, optimization, product, interchangeability, process, operating, condition, furnace, system, insulation, capacity, temperature

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### OBJECTIVES

This project covers all activities regarding ET process - and product-quality improvements in the four PM European ET plants, particularly product interchangeability, standardization and optimization of blends, processes and products, technical review meetings and assistance in solving specific problems.

It includes related trials at affiliates or in the Miniprimary with the respective analytical follow-up, evaluation and reporting.

### STATUS

#### 1. Technical assistance to FTR-Onnens

##### 1.1 Process gas temperature/production rate

Referring to the previous quarterly report (1), Onnens has experienced a 30% loss in production capacity which could be corrected by abnormally increasing the expansion temperature from 365 to 375-380°C for a production rate of 1150 kg/h.

Further investigations (2) have shown that the process-gas velocity and tower-steam concentration were on the low side, 35.6 m/s and 55.1% at idle conditions.

The following changes (3) were introduced on the 7 and 16 June to optimize the tower conditions and to increase the heat transfer efficiency :

- a) Process-gas velocity was increased up to 39 m/sec at idle conditions, and balancing the tower pressure balanced so as to reduce the pressure difference between the rotary valves.
- b) Tower static-pressure was increased from 8 to 30 mbar in order to minimize air intake from the rotary valves.

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- c) Tower steam-concentration was increased to 74% at idle conditions.

These changes brought the process-gas temperature back to normal (365 - 370 °C) for a production rate of 1200 kg/h. No significant changes (3) have been noticed on the sieve size distribution, but we observed a reduction of the expansion rate from 106 to 98%. The CCV of the expanded tobacco decreased from 9.1 to 8.6 cc/g which coincides also with a slight increase in the production rate from 1150 to 1200 kg/h. This matter is being followed-up.

## 1.2 Insulation of the Furnace system

The furnace system in Onnens was originally insulated by 30 mm thick rockwool board (external insulation) resulting in extreme high metal-casing temperature ranging from 160 to 365 °C, for a skin temperature on the insulation from 60 to 82 °C at normal operating conditions of the furnace.

Since March 1990, and apart from the top part of the heat exchanger and duct work (due to a close-by sprinkler), all external insulations have been progressively removed, consequently reducing the metal-wall temperature down to 63-74 °C.

A metal fissure and a slight distorsion of the gas-duct expansion joint was discovered, as well as a possible leak of the process-gas heat exchanger.

Contacts have been taken with a local insulation specialist "Schneider Dämmtechnik AG" to inspect the condition of the internal insulation during the forthcoming summer shutdown.

## 2. Common spare process-gas heat exchanger

During this coming summer shutdown, FTR will replace their original process-gas heat exchanger by the common spare ABB Air preheater in stock. For the records, PMG-Berlin took the opportunity to replace their ABB Air preheater in Nov. 1989 by a locally made heat exchanger.

Following their recent incident (1), PMG-Munich was in a rush to order a new heat exchanger and opted for the German make which has so far not shown any deficiency in Berlin. The process-gas heat exchanger for Munich will be delivered in September 1990 and installed in Autumn 1991.

Bergen op Zoom will be the only factory which still currently operates with the original ABB Air preheater exchanger due most probably to less metal fatigue as they run in 3 shift operations.

A questionnaire was sent out (4) to all affiliates on June 8 1990 to ask their opinions concerning the most suitable heat-exchanger supplier and date of aquisition for the common spare unit.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

It was recommended (5) postponing the decision up to March 1991 to get more experience from Berlin and also as the unit ordered by PMG-Munich will be considered as common spare, up to its installation in Autumn 1991.

### 3. Ensuring product interchangeability, product and process optimization in the four European ET plants (1,6,7)

Phase 1: Review of operating conditions of the ET process and product-quality parameters in the four affiliates.  
After Munich, FTR and Berlin (1), this phase was completed for BOZ in week 17, 1990.

Phase 2: Evaluation and optimization of the ET process and product quality in the four European ET plants and exchange of technical know-how between affiliates.  
First evaluation discussions took place in week 27 and are expected to be completed in week 34 and 35 (20 to 31 August).

### 4. Capacity increase in BOZ

Planning for new capacity to meet long-term production-volume requirements is well under way, but market growth dictates that production rates of 1350 kg/h will be required in the near future.

Preliminary discussions took place on April 26, 1990 (8) during our ET-PAN Europe evaluation program. It was pointed out that the ETNA process is already saturated at 1250 kg/h and that any additional capacity increase will be detrimental to the product quality. We commonly agreed first to optimize the ETNA process, to minimize the severity of additional quality losses at a higher rate.

A guide of improvements (9) dated 21 June 1990 was submitted to BOZ by Jack Knight for eventual implementation during the Stoomwezen shutdown from July 12 to August 4, depending on time constraints.

The first optimization trial runs are foreseen after the shutdown while the capacity-increase trials will take place in a later stage after completion of the optimization work, with the collaboration of the process-development group.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### PLANS

- Assistance to BOZ in the Stoomwezen inspection program and in ET plant optimization from July 12 to August 4, 1990.
- Training of P. Wetzel in PM USA-Richmond in the manufacturing center and R&D from mid-September to mid-October, 1990.
- ET-PAN EUROPE MEETING with all affiliates in November 1990. Date and location have not been defined yet.

### REFERENCES

- (1) Wetzel-P.  
Lüthi-N. Quarterly Report, January - March 1990
- (2) Knight-J.-B. Tower conditions for Chinese Tobacco Expansion
- (3) Wetzel-P. Internal filing to ET - PAN FTR
- (4) Mottaz-B. ETNA process-gas heat exchanger
- (5) Wetzel-P. ETNA process-gas heat exchanger
- (6) Lüthi-N. ET-PAN EUROPE Project Outline
- (7) Wetzel-P. ET-PAN EUROPE Operating-Conditions Report
- (8) Koenders-G. Minutes of BOZ meeting
- (9) Knight-J.-B. Recommendations for Increasing Capacity - BOZ ETNA

PIW/nip/July 11, 1990  
ETPE290.qr

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : HUNT  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Borgognon-D. (DIB)  
KEYWORDS : hunt, us, fbo, lamina, cross, cutting, lpp

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### OBJECTIVES

This project, which is being carried out at the request of the Leaf Department (blending) has the following objectives :

- Evaluation of US FBO tobacco samples (small lamina)
- Trials of "cross cutting" in the Miniprimary (double cut)
- Groundwork to prepare the possible introduction of FB small lamina products in Europe according to LPP.

### STATUS

The two trials of "cross cutting" (double cut) carried out during the last period (1) were repeated. The tobacco used was the same single lot of bright tobacco. It was also not cased and cut at the same conditions:

- first cut: 1.4 mm; second cut: 2.8 mm
- first cut: 3.3 mm; second cut: 3.3 mm.

Analytical data (sieves and CV) showed similar results for the repetition (3), as compared to those of the trials carried out during the last period (2).

As the tobacco went through the cutter twice, it was also compressed twice. Pads were therefore generated.

In order to avoid pad generation, it was decided to cut tobacco only once. It was assumed that if a smaller strip size is used, only one cut is necessary to achieve the same particle size, while two cuts were necessary with larger strip size.

The smaller strip size was generated by a threshing of the strips in the TQA facilities with the Mac Tavish stem tester.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

After threshing, three cutting trials were carried out:

- 0.85 mm cut width
- 2.8 mm cut width
- 2.2 mm cut width

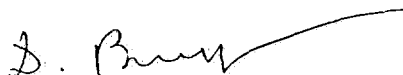
The analytical results (sieves and CV) show that the cut at a larger width is positive for small lamina (3). In order to continue the trials, contacts were taken with GBE Legg in the UK in order to try special knives on the cutter. Two of their representatives visited us on June 22. During the meeting, these knives were defined and ordered.

### PLANS

To try special-shape knives on our Hauni KTF, in order to generate rectangular particles.

### REFERENCES

- (1) Borgognon-D., Profs note to Salmon-B., Results on Project HUNT, April 18, 1990
- (2) Borgognon-D., Profs note to Salmon-B., Results on Project HUNT, June 7, 1990
- (3) Borgognon-D., Quartely report, January - March 1990



DIB/vag/July 7, 1990  
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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : MARIA  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Lüthi-N. (NIL)  
KEYWORDS : maria, expansion et, fc, or

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### OBJECTIVES

This project aims at developing cigarillos type cigarettes.

### STATUS

In the context of this project, two expansion runs of 1000 kg each were carried out in May in the FTR ETNA installation in Onnens.

The tobacco for the two trials, consisting of 100% Virginia resp. 71.6% Virginia and 28.4% Orient were conditioned, cased and cut at 1.0 mm (instead of normally 0.85 mm) on May 8, 1990 in the FTR Primary and expanded the next day in Onnens.

A trial report was issued jointly by the ET Process Engineer and the undersigned (1). The necessary follow-up with the expanded tobacco will be carried out by the Product Development group.

### REFERENCE

- (1) Lüthi-N.,  
Dufour-P. Report to de Borst-E., "Essais d'expansion MARIA",  
May 31, 1990

*U. Lüthi*

NIL/vag/July 12, 1990  
mari290.qr

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : MINIPRIMARY  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Borgognon-D. (DIB)  
KEYWORDS : miniprimary, operation, batch, equipment,  
vinci, ht-tunnel, hauni, heinen

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### 1. OPERATIONS

The following batches were processed through the Miniprimary during the reporting period (50 planned working days) :

	50 planned working days (April - June 1990)
For Product Development :	31
For Process Development :	13
For Quality Assurance :	4
For Research :	0
For FTR :	0
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### 2. EQUIPMENT (Project LORRAIN)

#### OBJECTIVES

- Evaluate the replacement of a strip steaming conveyor in the Miniprimary with a Heat Treatment Tunnel (HT) before the dryer.
- Develop layout and finalize all technical details for an offer with the equipment supplier.
- Establish budget and 650.
- Install equipment and modify layout accordingly, organize start-up and acceptance trials.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### STATUS

An offer from Hauni was received and technical details evaluated (1). On June 27, the offer was discussed in detail with an engineer from Hauni.

### PLANS

To get a new offer modified in relation to our talks with Hauni, and then establish the 650.

### REFERENCE

- 1) Hauni, Hamburg Offer Nu. 1056/2/326, June 19, 1990



DIB/vag/July 10, 1990  
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RESEARCH AND DEVELOPMENT, NEUCHÂTEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : MODIGLIANI  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Wagoner-R. (RWA), Frattolillo-A. (ANF)  
KEYWORDS : modigliani, tiziano, stems, puffing, expansion

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OBJECTIVES

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Evaluation of the Comas stem puffing process to determine the effects on final stem quality parameters.

STATUS

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As an extension to Project Tiziano, a set of trials was run at Comas in Week 25, processing stems which had been conditioned, rolled, and cut at Bergen op Zoom. Prior to entering the puffing/drying operation at Comas, the CRS was conditioned from the cutting moisture of 30% OV to 35% and 45% OV. Processing temperatures were set to produce a final product moisture of 13-14%.

From visual observations of the final products, it was concluded that the stems were highly puffed/expanded. The products have been received in Neuchâtel for analysis and comparison to Bergen op Zoom HS obtained from the same batch of stems as the above feedstock.

PLANS

=====

Complete physical, chemical, and subjective comparison of the Comas processed stems versus the BOZ HS.

Determine whether further trials are required comparing the Comas stems to stems processed at other PM locations.

*S. John Wagoner*

RWA/vag/July 6, 1990  
modi290.qr

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## RESEARCH AND DEVELOPMENT, NEUCHÂTEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : NILE  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Lüthi-N. (NIL)  
KEYWORDS : nile, us, blend, filler, expansion, et, ftr,  
fc, or, recon, bur, mlf,

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### OBJECTIVES

The aim of this project is to evaluate the concept of producing an American-blend filler by total blend expansion in an expansion tower. This blend can contain flue-cured, oriental, untreated/treated Burley, Recon, but no add-backs.

### STATUS

In the context of this project a new series of three trials was carried out in April in the FTR ET installation in Onnens (1, 2). Within this trial program for the first time a "real" MLF type blend including treated Burley and Recon was tried for expansion. The first run with 2000 kg of an MLF-type blend composed of 28.7% treated Burley, 31.5% Virginia, 15% Orient and 24.8% Recon was expanded on April 4, 1990 without any special problems. However because of a low cut-rag OV with only 18%, the standard conditions for total blend expansion had to be adapted accordingly. In order to find out the impact of Burley casing and PC on the expanded product a second trial - with 2000 kg of the same tobacco blend as the first one - was carried out. This time however, the "Burley casing" and "PC" were composed of water only. No special problems were observed during the expansion of this "water-cased" tobacco on April 11, 1990.

In addition, 2000 kg of another MLF-type tobacco blend, with no Recon, was expanded on the same day, again without any problems. A trial report was issued jointly by the ET Process Engineer and the undersigned (3).

The necessary follow-up with the expanded tobacco will be carried out by the Product Innovation group at R&D Neuchâtel.

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

REFERENCES

- (1) Braem-D., Minutes to distribution, "Total-blend expansion meeting", February 28, 1990.
- (2) Braem-D., Profs note to distribution, "Project NILE, total blend expansion", March 12, 1990.
- (3) Lüthi-N.,  
Dufour-P., Report to Babey-S., "Essais d'expansion NILE",  
May 11, 1990.

NIL/vag/July 12, 1990  
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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : NOLDE  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Hofmann-H. (HHO)  
KEYWORDS : nolde, burley, casing, temperature, profile,  
capacity, munich

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### OBJECTIVES

In view of the PM-USA/Europe Burley treatment standardization program requested by PM-EEC AOD for enhancement of product uniformity, trials are to be carried out in the Munich primary. The two process parameters concerned are :

- a) Concentrated Burley spray
- b) Lower drying temperature and profile change.

Test definition and process parameters are co-ordinated between QA and Process Development, analytical follow-up and subjective evaluation with local and HQ leaf departments.

### STATUS

With reference to the Jan.-March status report the following activities have taken place:

- The Burley P&S dryer standardization/capacity increase test and reference runs were carried out in week 16/17 for ML010 (MLB-FR) and week 22/23 for PM010 (PMS).

Cigarettes of both blends were analytically, physically and taste evaluated.

The taste evaluation was performed for MLB-FR by panel A/B and PMS by the Munich expert panel. An evaluation report for MLB-FR has been issued by Munich, which will be followed by a final report for both blends.

- The Burley drying temperature profile for ML010 test and reference run was established. A more gentle drying in the first drying zone with the new profile (90-100-90°C) can clearly be seen. The temperature graphs were issued to Munich QA.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### Conclusion :

All objectives were achieved, i.e. :

- a) Application of concentrated Burley spray.
- b) Lower drying temperature and profile change.
- c) 12% drying capacity increase.

No significant differences regarding physical and smoke parameters of tobacco and cigarettes were seen. Taste evaluation was positive.

### Plans :

- Due to the future change of the Burley drying air temperature on all existing blends, a panel B taste-evaluation program will be established to ensure that all major blends are subjected to confirmation trials, which include a smoke and physical analysis.
- The temperature/profile change for all treated Burley blends will take place in August.

### REFERENCES

- (1) De Borst-E., to Friedrich-H., "Burley treatment processing specifications", November 20, 1989
- (2) Schwarb-A., to Kipfstuhl-J., "PMG-Munich P&S dryer standardization", January 30, 1990
- (3) Hofmann-H., to Fink-W., "Burley temperature profile", March 26, 1990
- (4) Strobel-U., to Hofmann H., "Capacity increase of Burley Line and adjustment to US-standardisation", April 4, 1990
- (5) Berney-J. to Strobel U., "Temperature profile", May 11, 1990
- (6) Strobel U. to Hofmann H., "Burley standardisation and capacity increase, results of test", May 17, 1990
- (7) De Borst-E. to Friedrich H. "Burley tests pmg, concentrated casing application", June 6, 1990

HHO/vag/July 5, 1990  
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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : PISSARRO  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Lüthi-N. (NIL)  
KEYWORDS : pissarro, expansion, run, et, munich, it, mti,  
fc, tobacco, diana, airco

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### OBJECTIVES

Assist PM - AOD Lausanne at the request of MTI to run a subjective qualification test in their Airco ET installation on our DIANA ET blend (ET 035).

### STATUS

Due to proprietary information and Primary processing differences, it was decided to use ET cut rag ex PMG-Munich for this qualification test (1). A total of about 1500 kg of ET 035 cut rag was packed on May 15, 1990 in PMG-Munich into 12 ET cardboard cases with plastic inner lining (about 130 kg net per case) and was shipped by refrigerated truck to Bologna, where it arrived on May 16 at about 10.00 a.m., as desired (2).

The expansion was carried out in the afternoon in Bologna using firstly the standard MTI expansion conditions such as a process gas temperature of about 355°C. This temperature had to be decreased as the tobacco coming out of the expansion tower was burnt. Finally at a temperature of about 330 to 335°C an acceptable expanded product was obtained.

The necessary follow-up with the expanded tobacco will be carried out by the PM - AOD in Lausanne.

### PLANS

Establishment of a final report with the results from the expansion run in Bologna and, for comparison, the results from the expansion of the remaining tobacco of the ET 035 laydown, carried out on May 15, 1990 in PMG-Munich.

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

REFERENCES

- (1) Hansen-M.      Profs note to Lively-R., "MTI Diet plant  
Bologna", April 10, 1990
- (2) Lüthi-N.      Memo to Hansen-M., "Project Pissaro, DIANA ET  
trial (ET 035) in Bologna", May 4, 1990.

*U. Lüthi*

NIL/vag/July 10, 1990  
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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : RUBENS  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Borgognon-D. (DIB)  
KEYWORDS : rubens, erni, fc, mw, ks, br, burley

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OBJECTIVES

This project is being carried out at the request of the Leaf Department as a follow-up of the FC-Brazil and Korea studies conducted in 1986 and 1987. Malawian FC and Burley tobaccos of equivalent grades are used. The project is divided into two parts for both FC and Burley :

1. Part one


This study was initiated in order to collect information on the physical and chemical properties of hand-stripped versus machine-threshed Malawian tobacco, to relate cut-filler quality to strip size and to evaluate the corresponding TLA-type cigarettes.

2. Part two

The second part was organized to consider the influence of package OV and compression (density) on tobacco strip size and cut-filler size. In order to conserve the OV, tobacco was packed with poly-liners in its country of origin.

STATUS

The evaluation of the results is in progress and we expect to complete the final report before the end of September 1990.



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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : SPENCER  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Lüthi-N. (NIL)  
KEYWORDS : spencer, et, china, fc, strips, expansion

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### OBJECTIVES

Assistance to FTR in conducting expansion trials in Onnens using flue-cured strips received from China, in order to evaluate process and product parameters for the two ET Plants to be erected by PM in China.

### STATUS

A total of 6000 kg of four different qualities of flue-cured strips from China arrived in Onnens on May 22, 1990. This tobacco was marked with six different codes (grade A to F), each composed of 1000 kg of strips, whereby grade A and B resp. D and E were of the same tobacco quality (1).

Four laydowns of 1000kg strips each ( grade A, D, F and C) were processed in the FTR primary on June 5, 1990 and expanded in Onnens the next day supervised by J. Knight from PM Asia accompanied by J. Williams from PM USA.

Due to the "unknown" behaviour of these tobaccos during the processing in the Primary, very high cut rag OV's were obtained, ranging from 22.0% for grade A up to 24.0% for grade C.

Because of these high OV's the expansion conditions such as process gas temperature and tobacco flow into the tower had to be adapted accordingly.

On June 12, 1990 the two remaining tobacco laydowns (grade B and E) were successfully processed in the Primary, cut rag OV's below 21% and were expanded the next day in Onnens using quite standard expansion conditions.

The Chinese tobaccos expanded well and in general expansion rates of over 100% were obtained.

All expanded tobacco will be shipped back to China for their own evaluation.

A trial report and an operating-condition report were issued (2, 3).

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

REFERENCES

- (1) Lüthi-N., Memo to distribution, "Project Spencer, expansion trials in Onnens using Chinese tobacco", April 11, 1990.
- (2) Lüthi-N.,  
Dufour-P. Report to Knight-J., "Expansion tests Spencer", July 4, 1990.
- (3) Wetzel-P., Report to distribution, "Project Spencer, Operating condition report", July 5, 1990.

NIL/vag/July 12, 1990  
spen290.qr

2028634501

## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : SPITZWEG  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Hofmann-H. (HHO)  
KEYWORDS : spitzweg, berlin, burley, casing, temperature,  
profile, capacity

---

### OBJECTIVES

In view of the PM-USA/Europe Burley treatment standardization program requested by PM-EEC AOD for enhancement of product uniformity, trials are to be carried out in the Berlin primary. The two process parameters concerned are :

- a) Concentrated Burley spray.
- b) Lower drying temperatures and profile changes.

Test definition and process parameters are co-ordinated between QA and Process Development, analytical follow-up and subjective evaluation with local and HQ leaf departments.

### STATUS

Due to drying capacity and product uniformity needs, it was decided to split the project into two parts for Berlin.

- 1) Burley drying capacity increase and concentrated Burley spray.
- 2) Change of present Burley drying air temperature profile.

With reference to the Jan. - March status report the following activities have taken place.

The first part of the project, i.e. Burley drying capacity increase of 20% and application of concentrated Burley spray on the old dryer has been completed.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

The appropriate test and reference runs ML039 (Marlboro DB) and PM037 (Marlboro Lights) were carried out in week 20. Test and reference cigarettes were subjected to taste evaluation (Panels A and B) and the smoke analysis was done in the Munich smoke lab. Detailed evaluation reports were issued by Berlin QA and analytical services Munich respectively.

### Conclusion:

Both objectives of Part one, i.e. capacity increase and application of concentrated Burley spray were fully achieved and accepted by Panels A and B. No significant differences regarding physical and smoke parameters of tobacco and cigarettes were seen. Taste evaluation was positive.

### PLANS

- Co-ordination of test plan with QA Berlin.
- Co-ordination with R&D Microbiological section.
- July 1990, qualification of first new Burley dryer (concentrated Burley casing and temperature profile as old dryer), with analytical follow-up and subjective evaluation (Panel A/consumer test).
- After qualification of first new dryer, the old dryer will be dismantled and the second new dryer installed and qualified.
- Monitoring of the Burley temperature profile (referred to in the last quarterly report) is to be carried out as soon as the prerequisites are met.

### Part Two :

- First quarter 1991, qualification run of second new Burley dryer with concentrated Burley casing and lower temperature profile, analytical follow-up and subjective evaluation (Panel A/consumer test).
- Drying temperature profile of second qualified dryer will be applied to the first dryer.

2028634503

RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

REFERENCES

- (1) De Borst-E., to Friedrich-H., "Burley treatment processing specifications", November 20, 1989
- (2) Schwarb-A., to Kipfstuhl-J., "PMG-Berlin P&S dryer standardization", February 1, 1990
- (3) Hofmann-H., to Fink-W., "Burley temperature profile", March 26, 1990
- (4) Tessendorf-W. to Hofmann H. "standardisation of the Burley process and qualification of 2 new P&S Burley drier", May 9, 1990
- (5) Tessendorf-W. to Hofmann H. "Standardisation of the Burley process and qualification of 2 new P&S Burley driers, results of first step", June 1990
- (6) De Borst E. to Friedrich H. "Burley tests PMG, concentrated casing application" June 6, 1990

*J. Hofmann*

HHO/vag/July 7, 1990  
spitz290.qr

2028634504

## RESEARCH AND DEVELOPMENT, NEUCHÂTEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : TIZIANO  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Frattolillo-A. (ANF), Pulfer-P. (PEP)  
KEYWORDS : tiziano, stem, expansion, comas, mti

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### OBJECTIVES

Assistance to MTI (Monopolio Tabacchi Italiani) for the evaluation of CS (Comas Stem) in the context of possible future implementation in the DIANA blend (1) providing :

- on-site support during trial processing with analytical follow-up in R&D
- evaluation of the Comas stem line including process parameters
- recommendations for possible improvements.

### STATUS

This project is completed and the final report was issued in May 1990 [5].

### SUMMARY/RESULTS

A trial was carried out using 1'000 kg of FC stem blend. The CRS (cut rolled stem) were produced in Verona followed by COMAS treatment in Trieste.

Samples of both CRS and CS (Comas stem) were analysed in the R&D facilities in Neuchâtel.

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

The physical and chemical quality results showed the following differences between CRS (after cutter) and CS (after COMAS stem puffing) :

- Significantly higher sieve size for CS,
- CCV increase of 18.7% for CS,
- No changes in chemical parameters before or after COMAS treatment,
- High equilibrium moisture for CS (15.2% vs 13.7% for CRS)

REFERENCES

=====

- (1) Trento-A. to MTI, Omologazione Costole COMAS, February 20, 1990
- (2) Pulfer-P. to Wood-C., trip report, February 27, 1990
- (3) Frattolillo-A. to Trento-A., Project TIZIANO, forthcoming trip to MTI Verona and Trieste, March 9, 1990
- (4) Frattolillo-A./Pulfer-P. Quarterly report, January - March 1990
- (5) Frattolillo-A./Pulfer-P. Project TIZIANO, Final report, May 1990

P. Pulfer

ANF/PEP/vag/July 9, 1990  
tizi290.qr

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : TOBACCO PROCESS QUALITY (GIOTTO)  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Frattolillo-A. (ANF)  
KEYWORDS : tobacco, process, quality, giotto, pme

---

### OBJECTIVES

- To provide tobacco quality comparisons between PME affiliates from the process point of preconditioning to the cigarette finished product.

The program compares Pan-European and German Marlboro tobacco processes and will show the impact of individual unit processes upon tobacco quality in terms of sieve analysis, filling power, moisture control, and other quality parameters.

These results will be used to evaluate process quality via standard procedures and common sampling points in a standardized reporting format to facilitate comparative analysis.

- To improve overall tobacco processing by optimizing tobacco-process quality and reducing degradation and losses: optimizing cigarette quality and maximizing yield.

### STATUS

- The first quarter 1990 report with comparative factory profiles was issued (1), as well as the March, April and May 1990 monthly reports (2).
- In conjunction with the R & D Computer Support Group, a timetable for direct computer transmission of data to R & D from each affiliate has been tentatively defined for end 1990.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### PLANS

- On a routine basis, evaluate product-quality results in relation to tobacco-processing modifications, equipment changes, blend changes, capacity and flow rates, measurement methodology and process specifications.
- Based on consistent tobacco-process-quality improvements in combination with quality-audit results, make recommendations in regard to process improvements and process specifications.

### REFERENCES

- (1) - Tobacco Process Quality Program, GIOTTO, Factory and Comparative Profiles, first quarter 1990.
- (2) - Tobacco Process Quality Program, GIOTTO, monthly reports March, April and May 1990.

ANF/vag/July 9, 1990  
tpq290.qr

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## RESEARCH AND DEVELOPMENT, NEUCHÂTEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : WARHOL  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Lüthi-N. (NIL), Wetzzel-P. (PIW)  
KEYWORDS : warhol, et, pan, expansion, trials, europe,  
us, mlf, ccv

---

### OBJECTIVES

Evaluation of Pan-European Marlboro ET expanded in the USA and US Marlboro ET expanded in Europe.

### STATUS

The trial results from the runs in USA and in Berlin were put together and sent to the Process Development group of R&D in Richmond for reviewing prior to their visit in Neuchâtel on July 9, 1990 (1).  
Handmade cigarettes of 100% ET of the various runs were smoke evaluated on June 25, 1990 by Panel A in Lausanne (2).

### PLANS

Discuss on July 9, 1990 in Neuchâtel the trial results with MM Burnley and Alonso from R&D Richmond in order to establish the final report with commonly agreed comments and conclusions.

### REFERENCES

- (1) Lüthi-N., Fax to Holland-T., "Project WARHOL trial results", June 27, 1990.
- (2) De Borst-E., Taste evaluation sheet on project WARHOL, June 25, 1990.

NIL/vag/July 13, 1990  
warh290.qr

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : PROCESS DEVELOPMENT  
SUBJECT TITLE : WHISTLER  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Pulfer-P. (PEP)  
KEYWORDS : whistler, primary, process, pm, european,  
affiliate, equipment

---

### OBJECTIVES

Collect and update information on Primary equipment and process-unit operations of PM European affiliates.

Develop a standardized format within Process Development for equipment and process data in order to have a baseline from which comparisons can be made and operational differences identified.

### STATUS

The "PRIMARY INFORMATION" reports containing information on equipment and process data of the four PM European Primaries are at the following various stages of completion :

- Bergen op Zoom (1) : distributed
- Berlin (2) : distributed
- Munich (3) : draft version completed, in process of  
being reviewed
- FTR : draft version at 50% completion

The concept, content and status of the "PRIMARY INFORMATION" report were presented in Berlin on April 25, 1990.

### PLANS

- Complete and distribute the "Primary Information" reports for Munich and FTR.
- Outline the major differences between the four affiliate Primary operations.
- Establish and implement an update procedure on a yearly basis.

RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

REFERENCES

- (1) Pulfer-P., Primary Information BOZ, October 1989
- (2) Pulfer-P., Primary Information Berlin, April 1990
- (3) Pulfer-P., Primary Information Munich, February 1990

P. Pulfer

PEP/vag/Jul 5, 1990  
whis290.qr

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NEW PROD. DEVELOPMENT

RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : NEW PRODUCT DEVELOPMENT  
SUBJECT TITLE : PRODUCT INNOVATION  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : GAWAD-A (AHG)  
KEYWORDS : project, cigarette, filter, papirossi, profile,  
puff, tube-in-tow, triple, volga, lena

---

PROJECT VOLGA - NO 0164

Objective  
-----

To develop tube-in-tow filters in order to produce 1-mg/4-mg-and-6-mg tar cigarettes (84 mm length) with improved initial puffs.

Status  
-----

Referring to our last quarterly report (Ref. 1), we produced two types of triple tube-in-tow filters at Intertaba. These filters have been produced to overcome the high variability of the initial smoke analyses of the dual tube-in-tow filter. Fig. 1 shows this filter design, which was also produced with non-perforated tube. Prototypes 47P and 48P were produced using these filters and standard PMS blend. Comparative data in Table 1 show that prototypes 47P and 48P have an improved coefficient of variation in TPM as compared to 35P (dual tube-in-tow filter). However, they are approaching the normal accepted levels of variation for standard brands.

Fig. 2 shows the improved puff profile of both prototypes 47P and 48P as compared to PMS and 35P (dual tube-in-tow filter). These two prototypes constructions were also produced with the Muratti Mild (Cortland) blend in order to subjectively evaluate this last version of triple tube-in-tow filter (56P and 57P). The taste evaluation by Panel A (Ref. 2) was as follows :

" Prototype 56P gives more satisfaction than 57P which subjectively has a higher RTD and its taste is thin. 56P gives a slight mouth coating after the initial puffs".

Plans  
-----

The triple tube-in-tow filter has a perforated tube which will be used to produce a 4 mg tar cigarette prototype. This prototype will be evaluated versus current 56P (3.4-mg tar).

The triple tube-in-tow filter (as used in 56P) was produced in

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

large quantities, in anticipation of a potential product test of 160'000 cigarettes.

### References

-----

- [1] Gawad-A, Quarterly report, October-December 1989.
- [2] Panel A, Project Volga, June 29, 1990.

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

TABLE 1 - PROJECT VOLGA

SMOKING ANALYSIS RESULTS VARIATION TPM MG/CIG

	$\bar{X}$	TPM S	C OV %
<u>Muratti Ambassador Ultra</u>			
4 analysed (triple filter)	4.0	0.23	5.8
<u>Muratti Ambassador KS</u>			
10 analyses (dual filter)	11.7	0.57	5.0
<u>Brunette Extra</u>			
5 analyses (PSP filter)	7.6	0.56	7.4
<u>Philip Morris Ultra</u>			
4 analyses (dual filter)	1.2	0.15	12.9
<u>Philip morris (PMS) Super Lights</u>			
4 analysis (single filter)	5.4	0.25	5.8
<u>Project Volga prototypes</u>			
47P / 3 analyses (triple filter)	5.0	0.54	10.7
56P / 1 analysis (triple filter)	3.8	0.38	10.1
48P / (no perforation)			
3 analyses (triple filter)	4.7	0.46	9.9
57P / 1 analysis (triple filter)	3.4	0.30	8.9
35P / 10 analyses	5.3	0.85	16.2
(dual tube-in-tow filter)			

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

PROJECT LENA - NO 0082

## Objective

**To develop a papirossi-like cigarette giving low-tar delivery.**

## Status

To achieve this, we produced a hollow carton tube at Intertaba in the format of 2 UP 100 mm. Each 50 mm mouth piece is attached to 34 mm cigarette rod as in Fig. 1. Prototype 2P was produced using this mouthpiece (carton tube) and a high-density tobacco rod made of total-blend expansion tobacco. The mouthpiece tube is then perforated by a lab macrolaser to achieve 36 % ventilation. Below are the smoke results and the physical parameters for this prototype.

Prototype		2P
Cig. format	[mm]	84/50/7.9
Blend code		ZB 028
Tar	[mg/cig]	9.3
SN	[mg/cig]	0.76
Tip. length	[mm]	54
Cig. RTD	[mm WG]	36
Cig. ventil.	[%]	36
Puff count	[nb/cig]	4.7

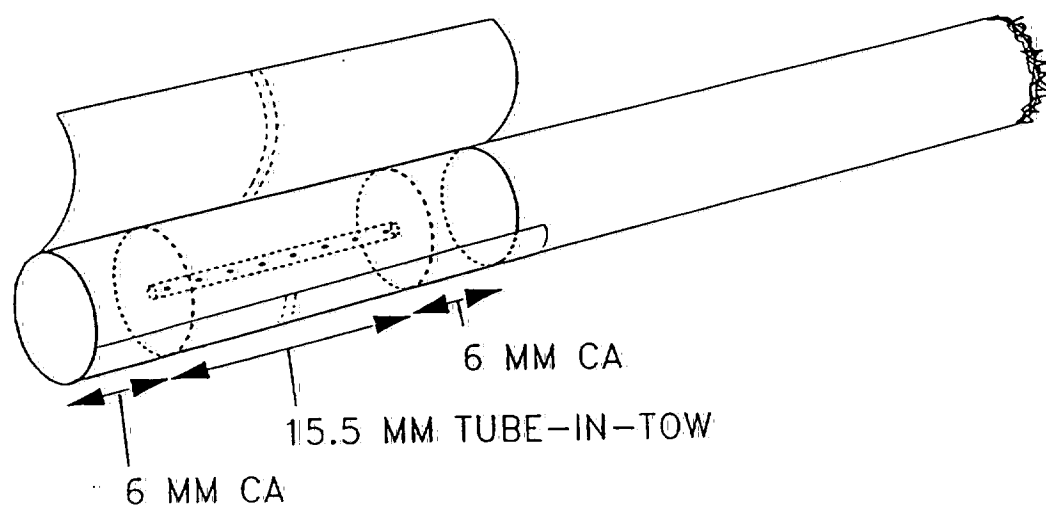
## Plans

Project Lena is completed.

*Samuel H. H. H.*

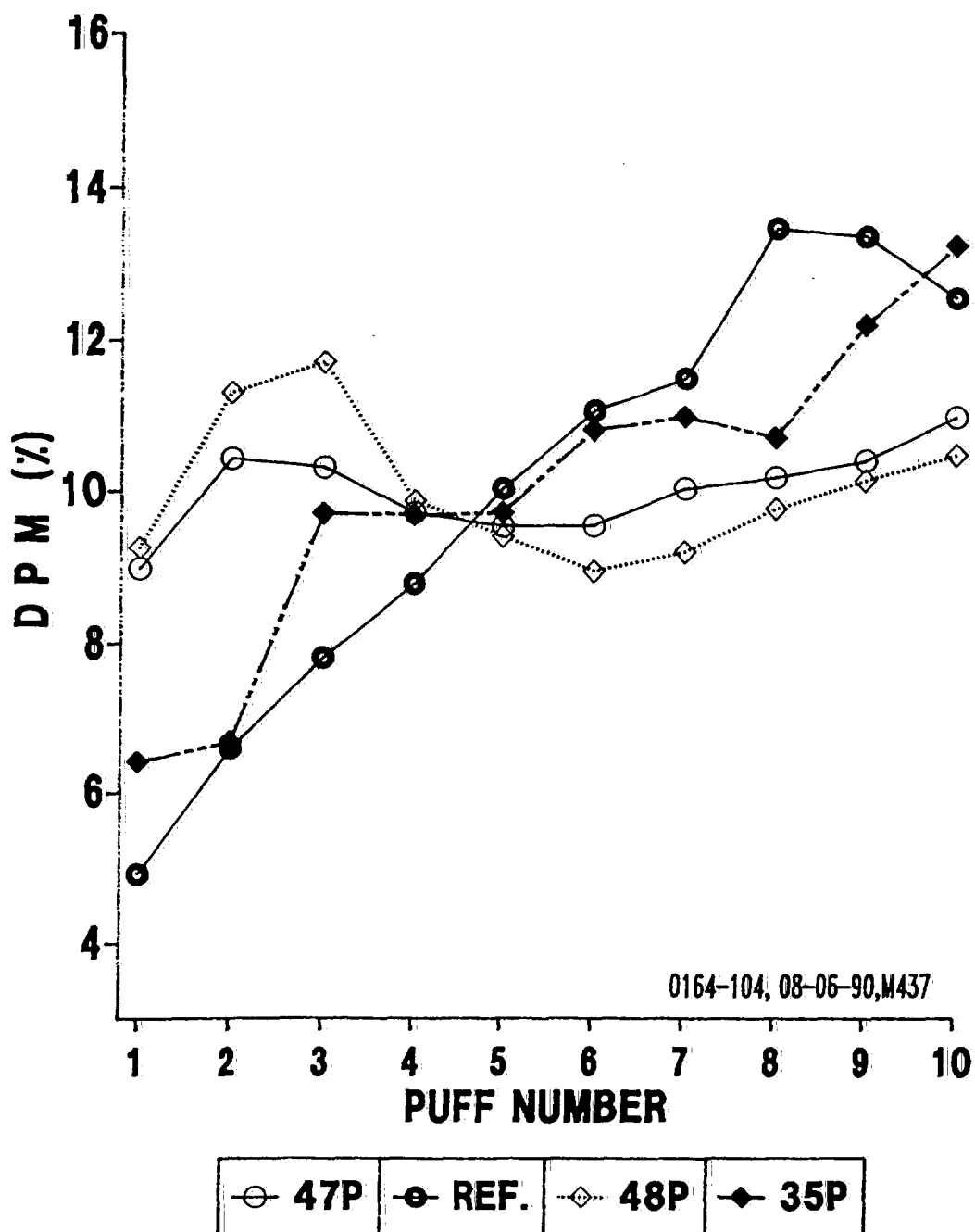
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# FIGURE 1 - PROJECT VOLGA TRIPLE TUBE-IN-TOW FILTER



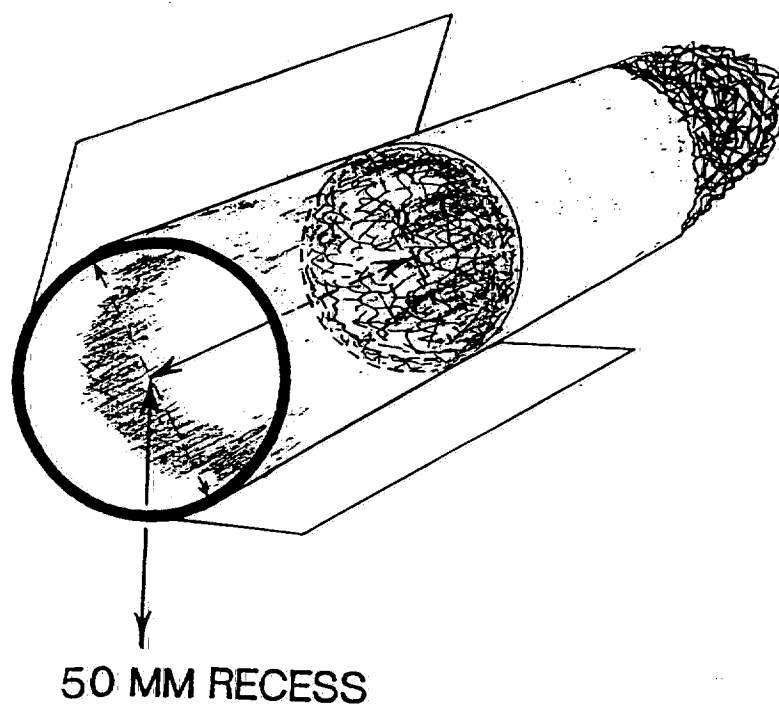
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# FIGURE 2 - PROJECT VOLGA PUFF-BY-PUFF-PROFILE



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## FIGURE 1 - PROJECT LENA



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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : NEW PRODUCT DEVELOPMENT  
SUBJECT TITLE : TECHNOLOGY DEVELOPMENT  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : GAWAD-A (AHG) AND BRAEM-D (DAB)  
KEYWORDS : nile, total, blend, expansion, cigarettes, casing

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PROJECT NILE - NO 4024

Objective  
-----

General evaluation of total-blend-expansion technology.

Status  
-----

In order to evaluate the effect of having casings and ingredients on tobacco before expansion, 3 batches were processed at 220 C.

ZB 028 : one American blend including recon (but no stems) with ML022 treatment.

ZB 029 : the same blend as above, only treated with water as a reference.

ZB 030 : the same blend but no recon with ML022 treatment.

Cigarette prototypes in MLK construction were produced. Table 1 shows physical and smoke data.

In general, analytical results are similar to those observed with untreated expanded blends (Ref. 1,2). The main difference between treated and untreated blends is firmness which is, as expected, better in the second.

Plans  
-----

After taste evaluation (Ref. 3), panelists recommended carrying out a new trial with a new blend containing an intermediate amount of recon between ZB028 and ZB030.

A total-blend casing will also be experimented in order to keep only one heat treatment during the process (expansion at 220 C). In that way, Burley treatment will be omitted.

Furthermore, another trial will be made by mixing tobacco expanded at 220 C with unexpanded treated tobacco.

RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

References

- 
- [1] De Zuanni-M and Braem-D, Quarterly Report, July-September 1988, p. 76.
  - [2] De Zuanni-M, Quarterly Report, April-June 1988, p.66.
  - [3] Taste evaluation, Panel A, dated June 15, 1990.

*De Zuanni*  
*Daniel Braem*

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# RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

TABLE 1 - PROJECT NILE

Prototype		64 P	65P	66P
Blend		ZB028	ZB029	ZB030
Cig. length	[mm]	84	84	84
Filter length	[mm]	21	21	21
Total weight	[mg/cig]	803	795	801
Tobacco weight	[mg/cig]	582	580	582
Cig. RTD	[mm WG]	128	135	149
Dilution	[%]	14	16	17
Firmness as is		3.95	3.03	3.33
Tar	[mg/cig]	11.6	10.7	12.1
SN	[mg/cig]	0.83	0.81	0.95
CO	[mg/cig]	12.8	12.0	11.2
Puff count	[nb/cig]	7.0	7.1	8.0

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : NEW PRODUCT DEVELOPMENT  
SUBJECT TITLE : CIGARETTE DEVELOPMENT EEMA  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : LIZZI-R. (RLI)  
KEYWORDS : stockton, dilley, sonora, tacoma, dieter,alec,  
alois,max,arnold,roger,derby,ventura,sandro,  
ch,sf,no

---

PROJECT STOCKTON (CH) - NO 0169

Objective  
-----

To develop a BRT using Nashville blend.

Format : 7.90/25/79.4 mm

Tar : 3.0 mg/cig

SN : 0.3 mg/cig

Status  
-----

Prototype 008P was selected for production start in FTR.

PROJECT DILLEY (CH) - NO 0158

Objective  
-----

To develop a BRP using Nashville blend.

Format : 7.90/79 mm (plain cigarette)

Tar : 19.0 mg/cig

SN : 1.1 mg/cig

Status  
-----

Prototype 004P was selected for production start in FTR.

PROJECT SONORA (CH) - NO 0157

Objective  
-----

To develop a BRF using Nashville blend.

Format : 7.90/19/79 mm

Tar : 15.0 mg/cig

SN : 0.9 mg/cig

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

Status

-----  
Prototype 004P was selected for production start in FTR.

PROJECT TACOMA (CH) - NO 0168

Objective

-----  
To develop a BRM using Nashville blend.  
Format : 7.90/19/79 mm  
Tar : 9.0 mg/cig  
SN : 0.8 mg/cig

Status

-----  
Prototype 002P was selected for production start in FTR.

PROJECT DERBY (CH) - NO 0884

Objective

-----  
To develop a Chesterfield Full Flavour using TINTIN blend.  
Format : 7.90/21/84 mm  
Tar : 14.0 mg/cig  
SN : 1.0 mg/cig

Status

-----  
Prototype 001P was selected for production start in FTR.

PROJECT VENTURA (CH) - NO 0885

Objective

-----  
To develop a Chesterfield Lights using TINTIN blend.  
Format : 7.90/27.5/84 mm  
Tar : 8.0 mg/cig  
SN : 0.6 mg/cig

Status

-----  
Prototype 005P was selected to be blind product tested.

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

PROJECT DIETER (SF) - NO 0894

Objective

-----  
To develop a Belmont 2002 Menthol.

Format : 7.90/20/79 mm

DPM (VTT): 5.0 mg/cig

SN (VTT) : 0.4 mg/cig

Status

-----  
Prototype 001P was selected.

PROJECT ALEC (SF) - NO 0891

Objective

-----  
Size change LS to KS on MLF.

Format : 7.85/21/84 mm

DPM (VTT): 15.0 mg/cig

SN (VTT) : 1.1 mg/cig

Status

-----  
Prototype 003P was selected and sent to Finland for VTT certificate.

PROJECT ALOIS (SF) - NO 0890

Objective

-----  
Size change LS to KS on MLL.

Format : 7.85/27.5/84 mm

DPM (VTT): 10.0 mg/cig

SN (VTT) : 0.7 mg/cig

Status

-----  
Prototype 001C1 was selected and sent to Finland for VTT certificate.

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

PROJECT MAX (SF) - NO 0889

Objective

-----

Size change LS to KS on BEO.

Format : 7.85/27.5/84 mm

DPM (VTT): 8.0 mg/cig

SN (VTT) : 0.5 mg/cig

Status

-----

Prototype 002C1 was selected and sent to Finland for VTT certificate.

PROJECT ARNOLD (SF) - NO 0892

Objective

-----

Size change LS to KS on BET.

Format : 7.85/27.5/84 mm

DPM (VTT): 5.0 mg/cig

SN (VTT) : 0.4 mg/cig

Status

-----

Prototype 003P was selected and sent to Finland for VTT certificate.

PROJECT SANDRO (NO) - NO 0895

Objective

-----

To develop a L&M Mild.

Format : 7.90/21/84 mm

Tar : 11.0 mg/cig

SN : 0.8 mg/cig

Status

-----

Prototype 002P was selected for production start in FTR.

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

PROJECT ROGER (NO) - NO 0896

Objective

-----

To develop a Mega Menthol.

Format : 7.90/33/84 mm

Tar : 7.0 mg/cig

SN : 0.6 mg/cig

Status

-----

Prototype 001P was selected.

R. /

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : NEW PRODUCT DEVELOPMENT  
SUBJECT TITLE : STUDIES AND MODELLING  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : BADERTSCHER-T. (TBA); DUSI-S. (SED)  
KEYWORDS : nipper, chisel, filtration, efficiency, tow,  
capacity, firmness, diffusion

---

PROJECT NIPPER - NO 8502

Objectives

-----  
Study the influence of filter length and denier per filament on filtration efficiency.  
Determination of the weight-RTD relationship (capacity curves) of the qualified tow items.

Status

-----  
The results of the filtration efficiency of filters made with different tow items at a length of 27.5 mm were reported in the last quarterly report (Ref.1). These filters were cut down to 21 mm in order to determine the filtration efficiency for that length.

The recent extension of our current Model for low diameters (project Hatchet) also required a review of the capacity curves of the different qualified tow items, specially with regard to the effect of diameter.

Results

-----  
a) Filtration efficiency

The first series of filters (27.5 mm length) made with different denier per filaments (dpf) gave higher filtration efficiencies than calculated with the modified formula from Kao (Ref. 1 and 2).

It was believed that this was the effect of the length of these filters, which is underestimated in the formula.

In the second series, these filters were cut down to 21 mm. The results of the efficiencies made in the smoking lab also showed systematically higher values than those calculated.

Based on these results and also considering other efficiency values from Cigarette Data Bank the coefficients of the equation were determined as follows :

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# RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

$$E = A + (1 - e^{(-1,171 - 0.000091 \text{ RTD} \cdot C^2 - 0.5224 \text{ l/d}) / Q})$$

where E = filtration efficiency (SN)  
 A = constant for Blend type (0.055 for American Blends)  
 RTD = filter pressure drop (mm WG)  
 C = tow circumference (mm)  
 l = filter length (mm)  
 d = denier per filament (g/9000 m)  
 Q = smoke flow rate (cc/s)

The analytical results obtained in this project compared to the calculated values are shown on Fig. 1.  
 We observed that the shorter filters (21 mm) correlated very well but the longer filters still gave slightly higher values than calculated.

## b) Tow Capacity curves

To evaluate the weight - RTD relationship valid for our production centers, a theoretical denier per filament (dpf) was determined based on the yearly mean analytical value of all single filters produced at PME.

These calculations are based on the formulae developed by R. Dwyer at PM USA (Ref. 3).

$$\text{RTD} = \frac{40 \cdot \pi \cdot \mu \cdot L_d^2 \cdot B \cdot Q \text{ m}^3}{\rho \cdot A_F^3 \cdot L_F^2 \cdot d \cdot D}$$

$$B = (0.315 + 0.765 \cdot \frac{L_F \cdot D}{m \cdot L_d}) (0.560 + 0.241 \cdot d^{0.5})$$

The dpf were obtained by iteration with the tow weight, diameter and RTD of a given filter. About 60 filters were analyzed this way.

The resulting dpf were averaged for a given tow item and the capacity curves calculated according to the above formulae. The minima and maxima were also determined according to Dwyer (Ref.3).

$$\alpha_{\min} = 0.0250 + \frac{D}{6.41 \cdot 10^5}$$

$$\alpha_{\max} = 0.0450 + \frac{D}{6.41 \cdot 10^5}$$

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

These capacity curves were plotted on fig. 2a-c together with those obtained from different suppliers.

The following observations can be made :

- RTD - weight.

In general we observe that the values for PME have a slightly higher weight for a given RTD than calculated by the suppliers. This shift can however be explained by the fact that RTD measurements from PME are about 4 % lower than those from the suppliers (Ref. 4).

- Minimum point.

A good agreement is achieved on the minimum RTD.

- Maximum point.

Substantial differences are also observed between the suppliers. This point depends particularly on the jet used and is therefore not well defined.

### Effect of filter diameter

With decreasing diameter of the filter, the tow weight of the minimum and maximum point of the capacity curve shifts towards lower weights.

This shift is however difficult to evaluate as it depends not only on the rest-crimp-ratio of the tow but also on the plug-wrap type (surface roughness) used.

For practice, a linear decrease of tow weight at minimum and maximum was introduced.

The effect on the capacity curves is shown in the example of tow 3.0Y/35'000 on fig. 3, together with the prediction models from the two tow suppliers Eastman and Rhodia.

$$\alpha_{\min} = 0.025 + (0.16 (0.77 - \text{Diam})) + \frac{D}{6.41 \cdot 10^5}$$

$$\alpha_{\max} = 0.045 + (0.14 (0.77 - \text{Diam})) + \frac{D}{6.41 \cdot 10^5}$$

### Conclusions

Integrating these results (together with those of project Hatchet) into the current Cigarette Model, increased accuracy will be achieved in the prediction of smoke deliveries. Furthermore, a better tow selection, specially with regard to smaller diameter, will be obtained.

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## RESEARCH AND DEVELOPMENT, NEUCHÂTEL - QUARTERLY REPORT

### Plans

-----  
No further action planned.

### PROJECT CHISEL - NO 8501

### Objectives

-----  
To investigate the influence of tobacco-rod compacity on mainstream and sidestream deliveries including puff by puff profiles.

### Status

-----  
The prototypes were made at six different compacities; they were weight selected  $\pm 10$  mg by a weight-selection machine. The RTD of the encapsulated rod and the dilution percentage of the tobacco rod (through the cigarette paper) were measured in the smoke analysis laboratory (routine). The determinations of delivery per puff (profiles) of DPM, SN and CO were made in the research division. The prototypes had the following dimensions:

Cigarette length	: 84 mm
Filter length	: 21 mm
Diameter	: 7.90 mm
Blend	: ML 022
Filter ventilation	: --
Cigarette paper	: WP 60

### Results

#### Mainstream

DPM, SN deliveries increase as tobacco weight increases to the critical weight, between 900-930 mg/cig (figure 6a, 6b).

But as weight increases above the 930 mg/cig, these deliveries decrease. For carbon monoxide (CO) the critical point (maximum) seems to move to the lower values of rod weight (between 850-900 mg/cig). However nitrogen monoxide (NO) is a linear function of the tobacco weight.

Increasing tobacco-rod density decreases tobacco-rod porosity (figure 7c) and also the average channel diameter. According to this :

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# RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

- the filtration capacity
- the resistance to draw RTD
- the dilution percentage (through the cigarette paper)

of the rod increase (Fig. 7a, 7b) and less volume of air enters by the coal; as result, the combustion characteristics and the temperature profiles of the tobacco rod change.

The functions of RTD rod, rod dilution percentage versus tobacco weight are linear up to the critical point 900-930 mg/cig (Fig. 7b). The slope of these functions changes above this point. Taking the whole weight range : between 700-1000 mg/cig they seem to behave as second-order functions versus tobacco weight. We make the assumption that the change of the slope is probably because of the change of the flow regime inside the tobacco rod which passes from laminar to turbulent flow at a critical rod RTD of 75 mm WG (strong increase of rod dilution). The filtration coefficients of SN, DPM and the diffusion coefficient (through the cigarette paper) of CO were calculated by using puff profiles (Ref.1,6). These results illustrate:

1. The diffusion of CO through the cigarette paper increases (rod-dilution percentage increases by increasing tobacco-rod density, Fig. 7a).
2. The tobacco-rod filtration for SN, DPM increases (Fig. 7a).
3. The CO/TAR ratio is influenced more by diffusion than the rod filtration; this ratio decreases by increasing tobacco-rod weight.

The measurements of the RTD of the encapsulated rod enable us to calculate the physical parameters of the tobacco rod such as the porosity, the average channel diameter (Ref. 5).

$$\epsilon = 0.4 + \frac{1.17 \cdot 10^{-2}}{A} \left( \frac{L}{\Delta P^*} \right)^{1/3} \quad (1)$$

- $\epsilon$  = Porosity of the tobacco rod (-)  
 $A$  = Cross-sectional area of the rod (mm<sup>2</sup>)  
 $L$  = Length of the rod (mm)  
 $\Delta P^*$  = Pressure drop of the encapsulated tobacco rod at 17.5 cm<sup>3</sup>/s (mm WG).

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RESEARCH AND DEVELOPMENT, NEUCHÂTEL - QUARTERLY REPORT

$$d = 1.02 \cdot 10^{-2} \left( \frac{L}{A \cdot \epsilon \cdot \Delta P} \right)^{1/2} \quad (2)$$

$d$  = The average channel diameter of the tobacco rod (mm)  
 $\Delta P$  = Pressure drop of the tobacco rod, RTD (mm WG)  
 $D$  = Rod dilution percentage (-)

The experimental data shows us that the ratio of  $\frac{D}{\Delta P}$  is steady throughout the range of the tobacco weight; using this information, we have developed a new relationship between the RTD of the tobacco rod and the RTD of the encapsulated tobacco rod (Fig. 7b, 7c).

$$\ln (\Delta P \cdot D) = m_1 \cdot \Delta P + m_2 \quad (3)$$

$m_1, m_2$  = coefficients.

Application to CHISEL gives : (Fig. 7d)

$$\ln (\Delta P \cdot D) = 0.38 \Delta P + 2.3 \quad (r^2 = 1)$$

Following correlations were made in order to put the experimental results in a mathematical form :

1. DPM, SN, CO deliveries are a function of the tobacco weight.  
 Example for DPM : (Fig. 4, 5a, 5b).

CHISEL gives :

$$\frac{\text{DPM}}{\text{PC}} = -3.10 \cdot 10^{-3} W + 4.5 \quad (r^2 = 1) \quad (4)$$

$$\text{PC} = 1.7 \cdot 10^{-2} W - 4.9 \quad (r^2 = 1) \quad (5)$$

Multiplication of the equations (4) and (5) gives a second-order function for DPM versus tobacco weight.

$$\frac{\text{DPM}}{\text{PC}} \cdot \text{PC} = \text{DPM} = -5.1 \cdot 10^{-5} W^2 + 9.2 \cdot 10^{-2} W - 22 \quad (6)$$

DPM : (mg/cig)

PC : Puff count (no./cig)

W : Tobacco weight of the given cigarette (mg/cig)

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The same form is used for SN and CO

$$\text{DPM} : B_1 W^2 + B_2 W + B_3 \quad (7)$$

$$\text{SN} : C_1 W^2 + C_2 W + C_3 \quad (8)$$

$$\text{CO} : D_1 W^2 + D_2 W + D_3 \quad (9)$$

(Fig. 6a, 6b)

$B_1, B_2, B_3, C_1, C_2, C_3, D_1, D_2, D_3$  are coefficients.

SN : (mg/cig)

CO : (mg/cig)

2. Mathematical prediction for CO/TAR ratio was developed by dividing the linear equations (10) and (11) (Fig. 5a)

$$\frac{\text{CO}}{\text{PC}} = a_1 W + b_1 \quad (10)$$

$$\frac{\text{TAR}}{\text{PC}} = b_1 W + b_2 \quad (11)$$

$$\frac{\frac{\text{CO}}{\text{PC}}}{\frac{\text{TAR}}{\text{PC}}} = \frac{\text{CO}}{\text{TAR}} = \frac{a_1 W + a_2}{b_1 W + b_2} \quad (12)$$

$a_1, a_2, b_1, b_2$  are coefficients, (Fig. 6c).

The NO deliveries are not influenced by the rod dilution, NO delivery versus tobacco weight is a linear function (Fig. 6b).

Firmness, static burning and the mass burning rates are linear functions versus tobacco weight. (Fig. 4, 8a, 8b).

Mass burning rate and the ratio of  $\rho \cdot \phi$  / SBT decrease very slightly for higher rod densities. This means that the diffusion of the oxygen into the coal (static conditions) becomes difficult.

MBR : Mass burning rate (mg/min)

$\phi$  : Cigarette diameter (mm)

$\rho$  : Tobacco rod density (mg/cm<sup>3</sup>)

SBT : Static burning time (min)

SBR : Static burning rate (mm/min)

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### Conclusions

-----  
Mathematical predictions of the experimental results are successful with tobacco-weight values between 700-900 mg/cig. However, for higher tobacco densities, the mathematical models give slightly different results compared to the experimental data.

### Plans

-----  
Mathematical prediction of the sidestream results for the same prototypes.  
Verification of the validity of the mathematical functions for the cigarettes containing total expanded tobacco.

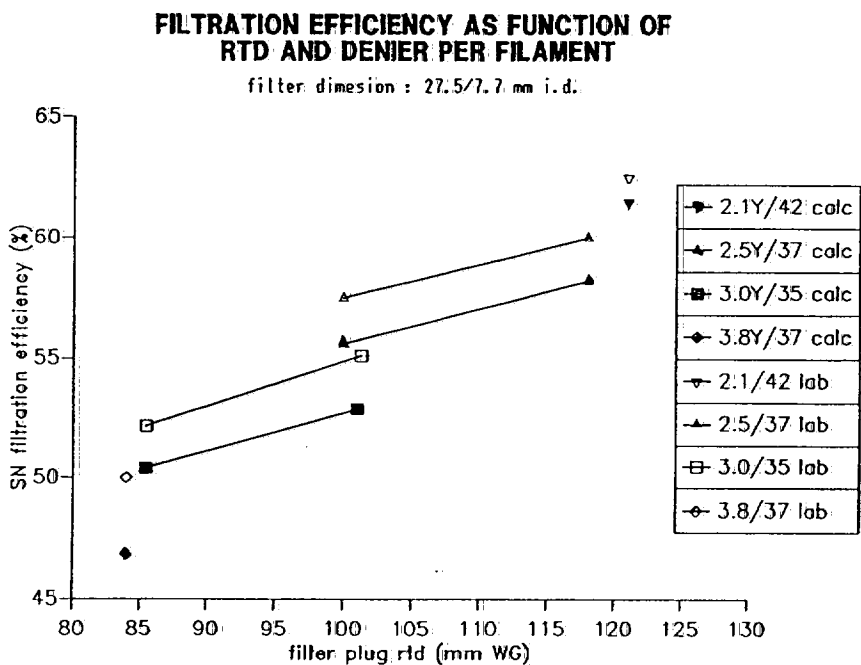
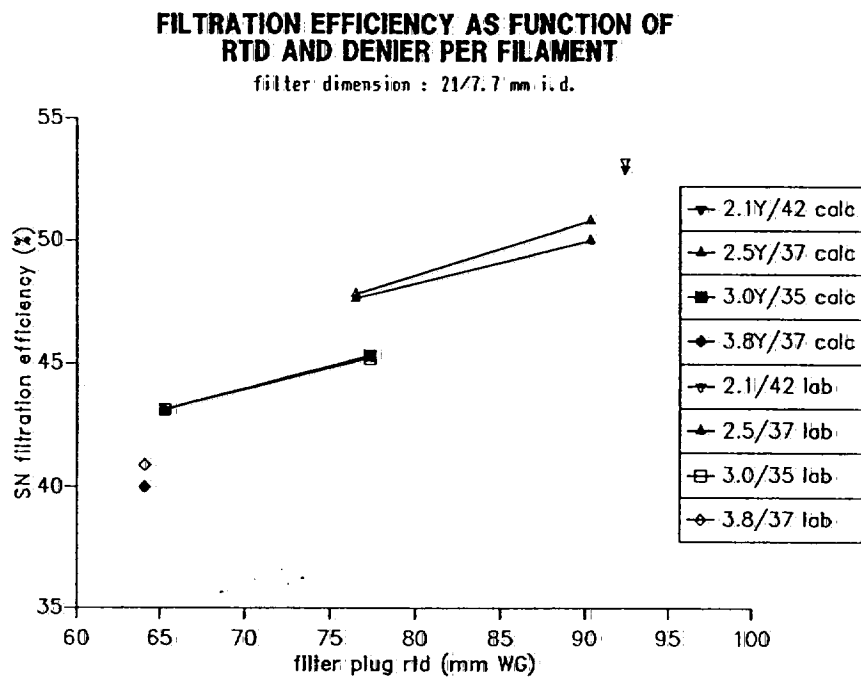
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- (1) Badertscher-T. Quarterly Report 01/90, January-March 1990  
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(4) Bel-T. Private Communication from Collaborative Test on filter rods between FTR and our different tow suppliers.  
(5) Dwyer-R.-W. and Morgan-C.-A. The physical characterization of low density and extruded tobacco rods. Inter-office correspondance, PM Richmond, March 28, 1986.  
(6) Letter from Renaud-J.-M. to Badertscher-T. dated April 26, 1990.

*S. Badertscher*

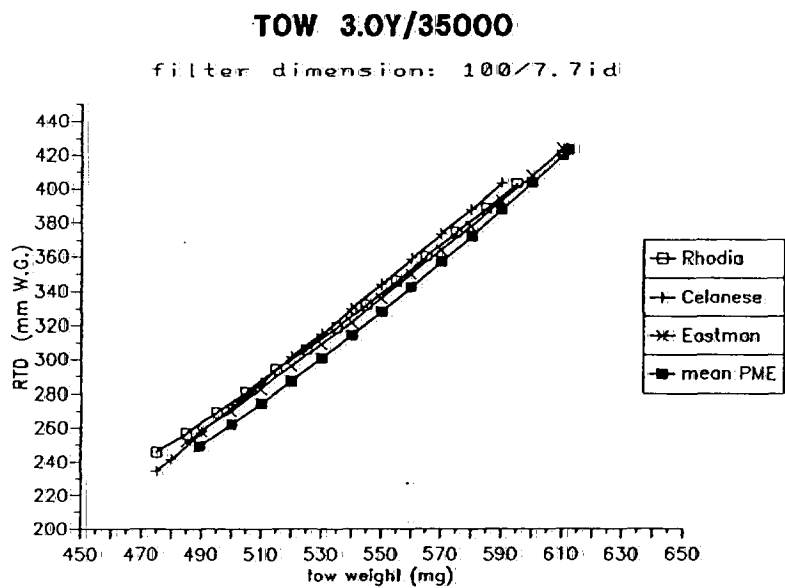
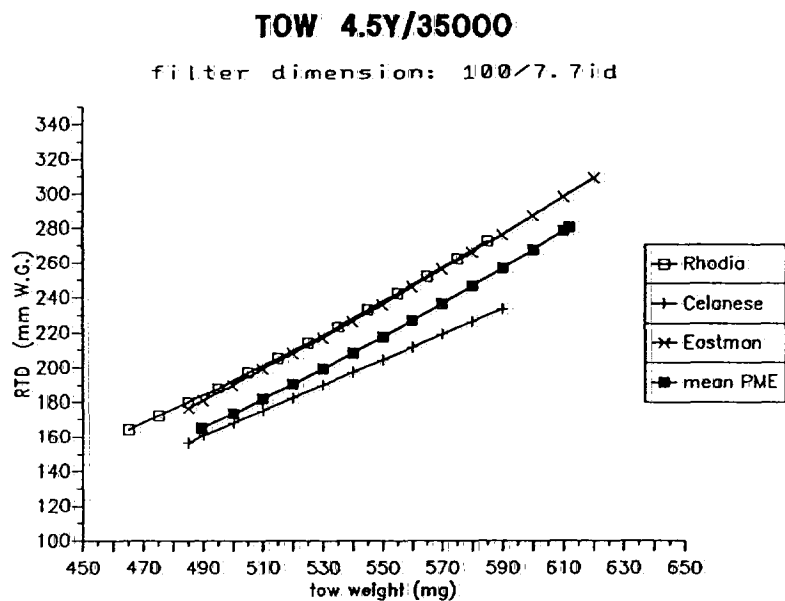
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FIGURE 1



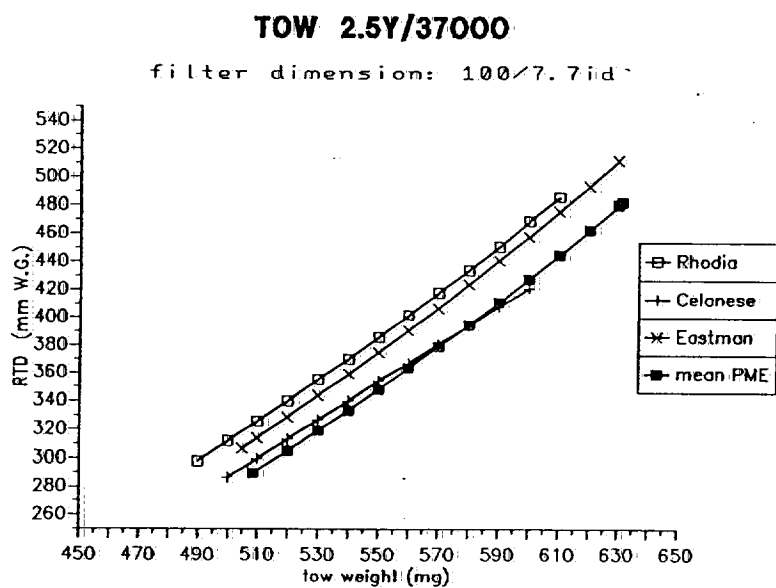
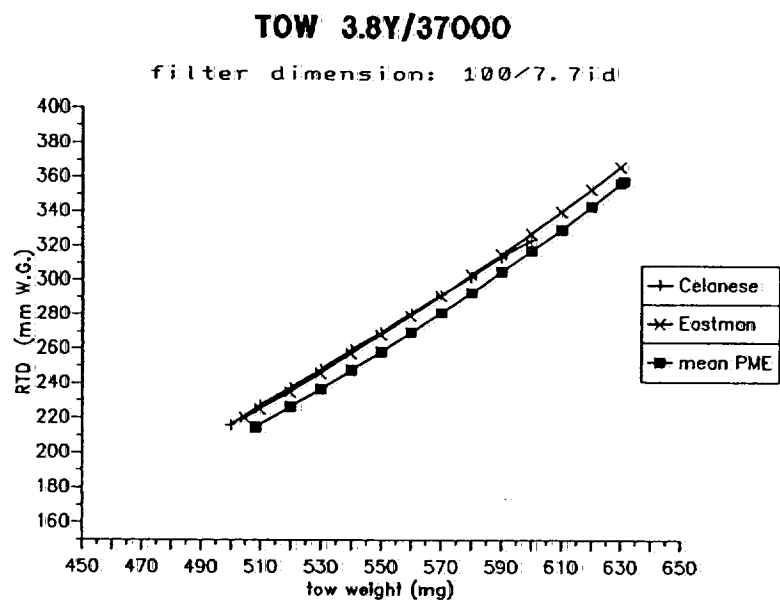
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FIGURE 2a



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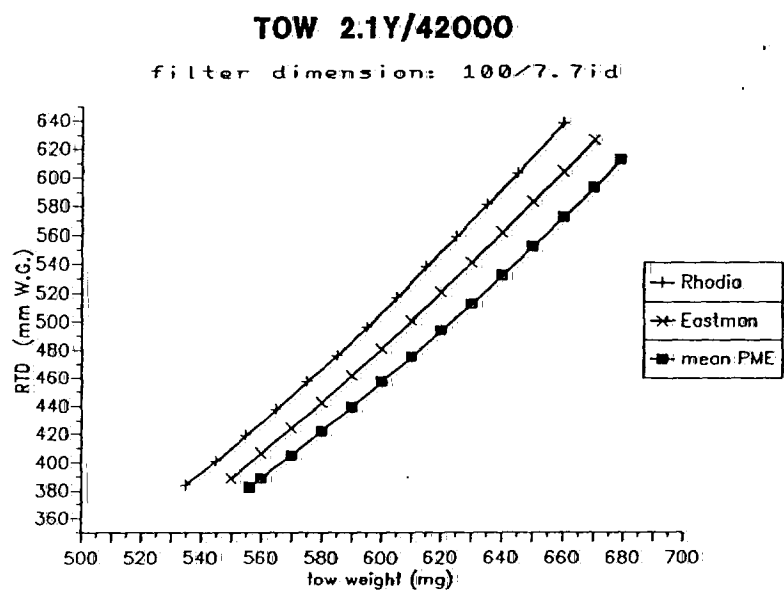
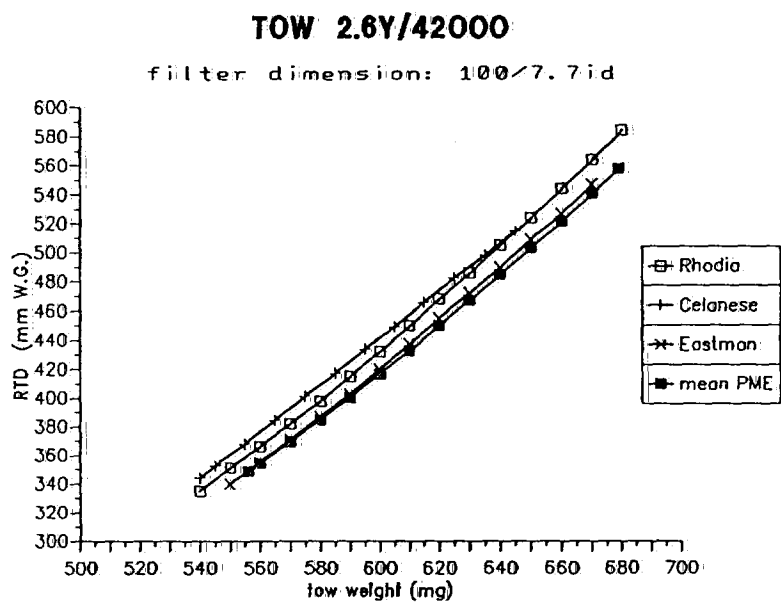
FIGURE 2b



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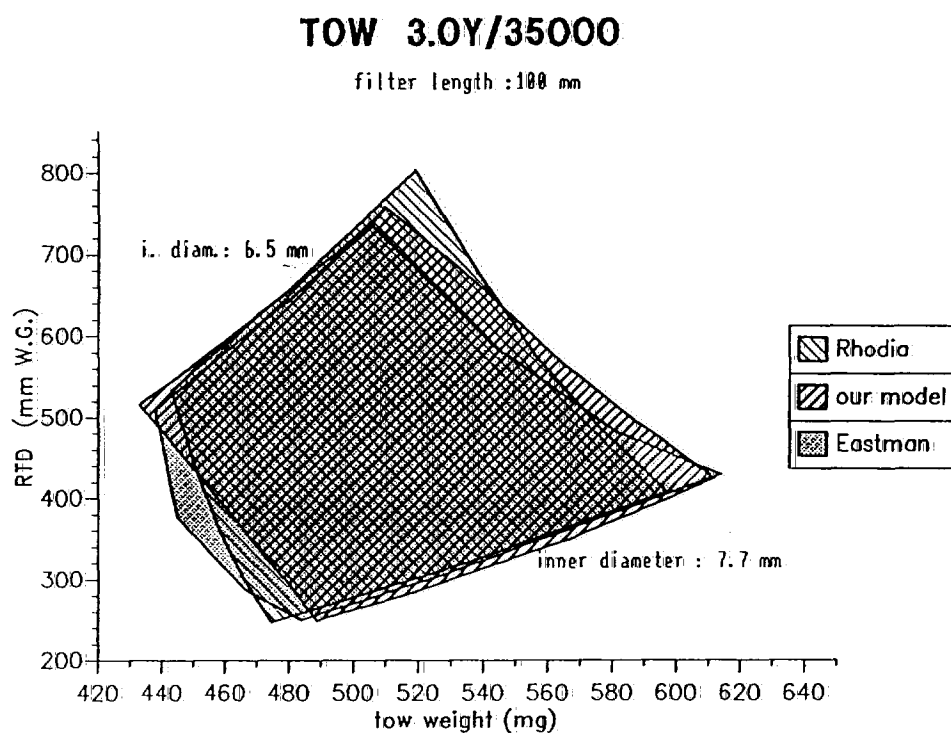


FIGURE 2c



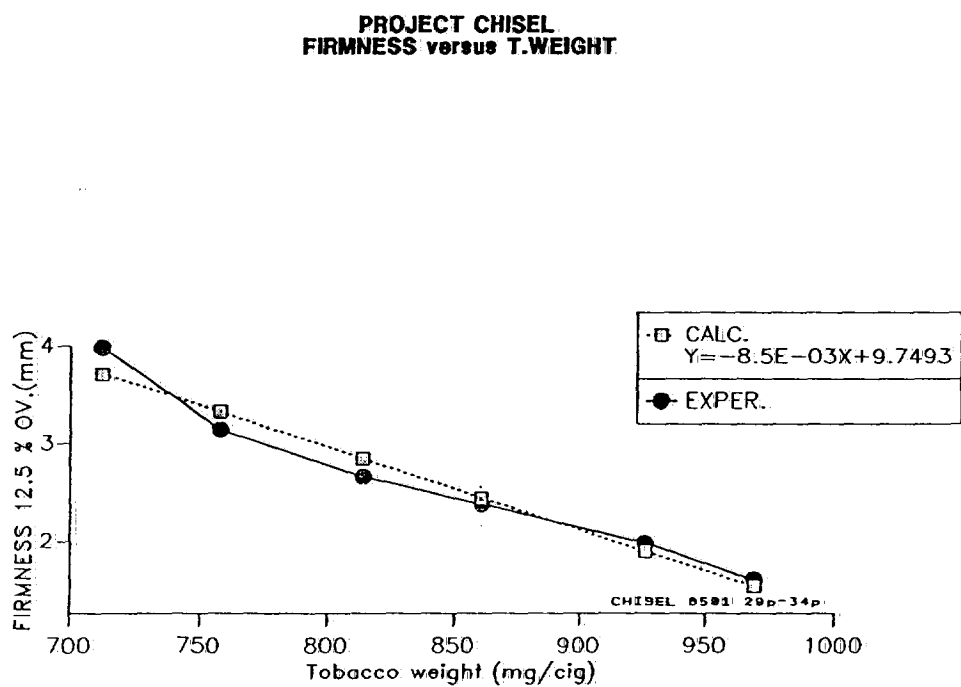
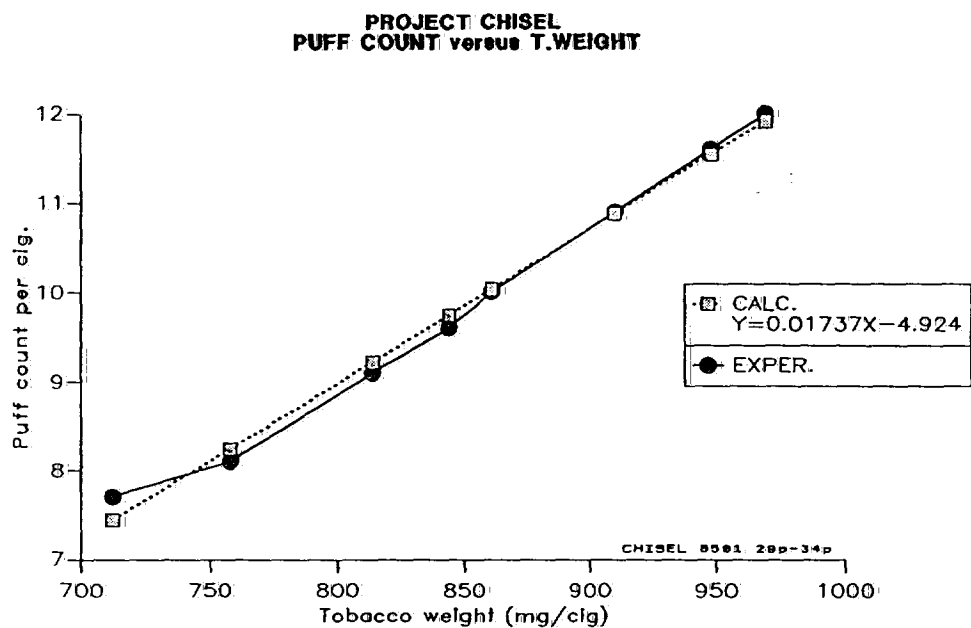
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Figure 3



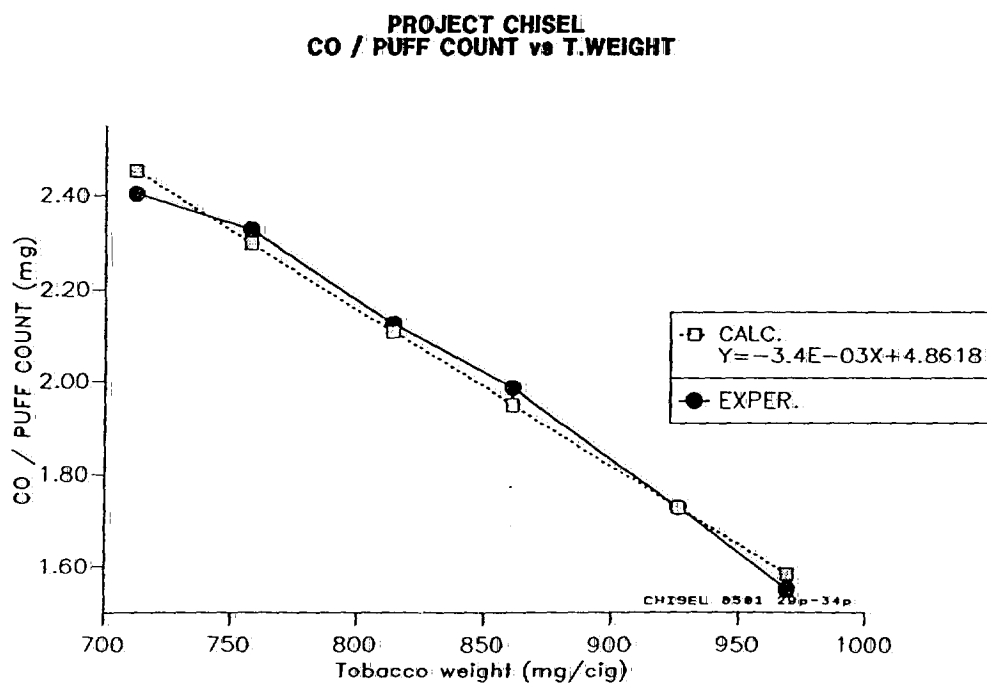
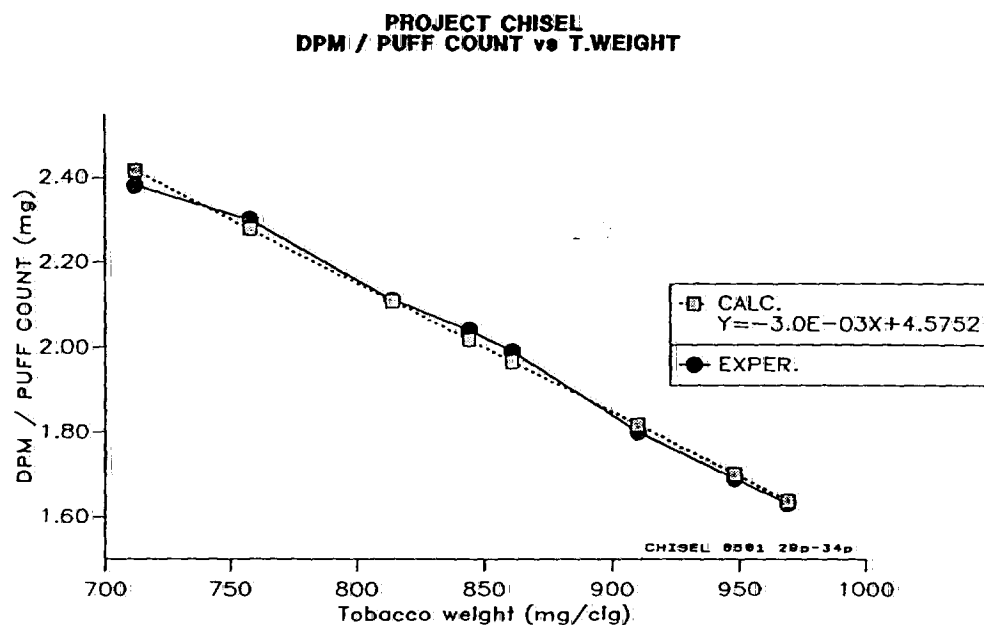
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FIGURE 4



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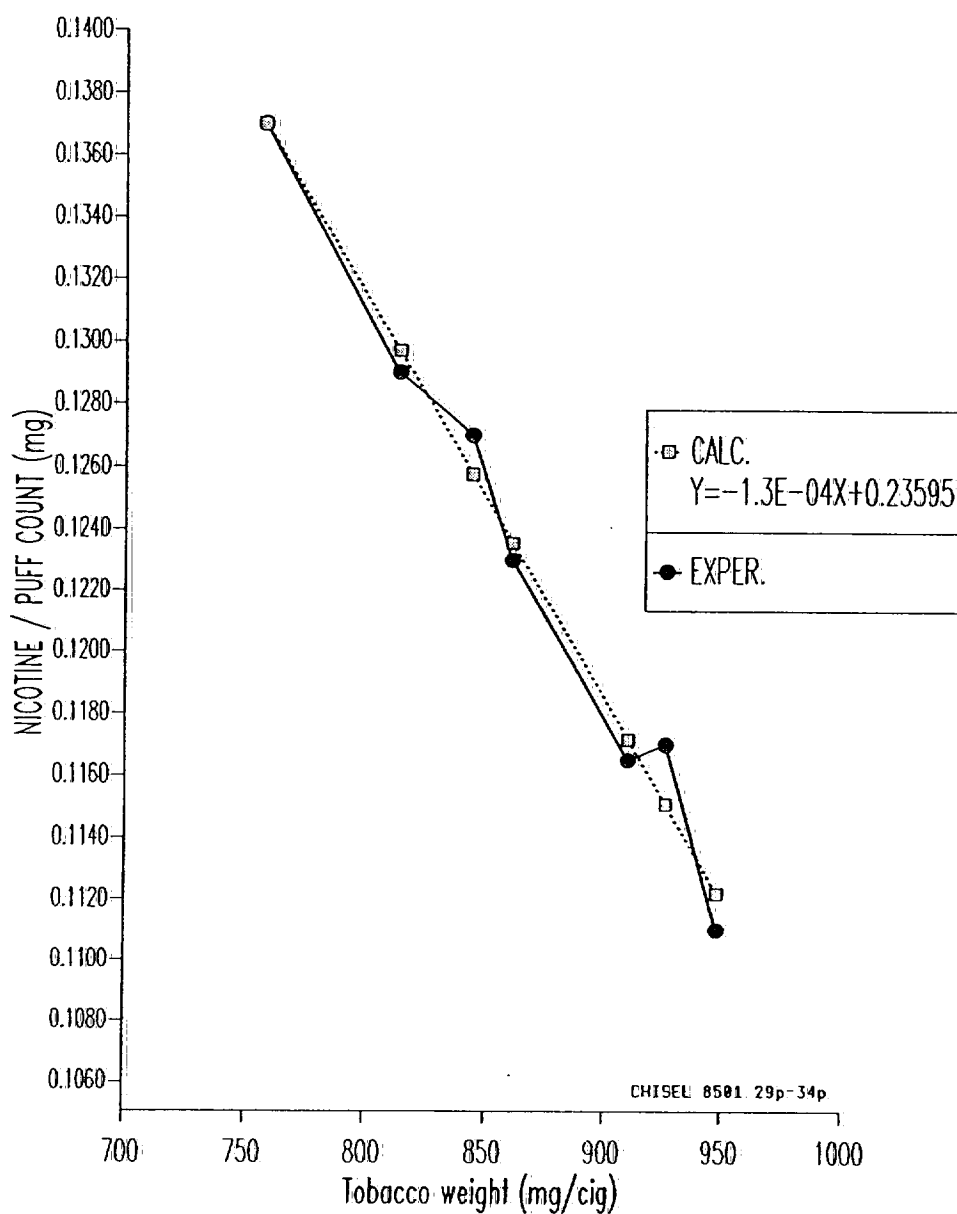
Figure 5a



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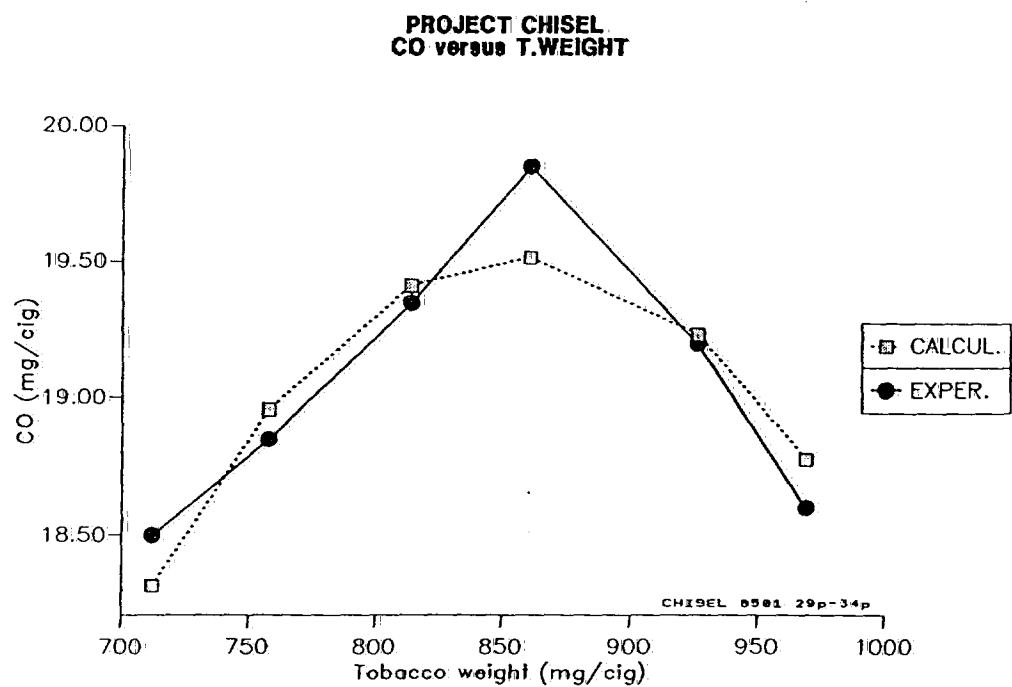
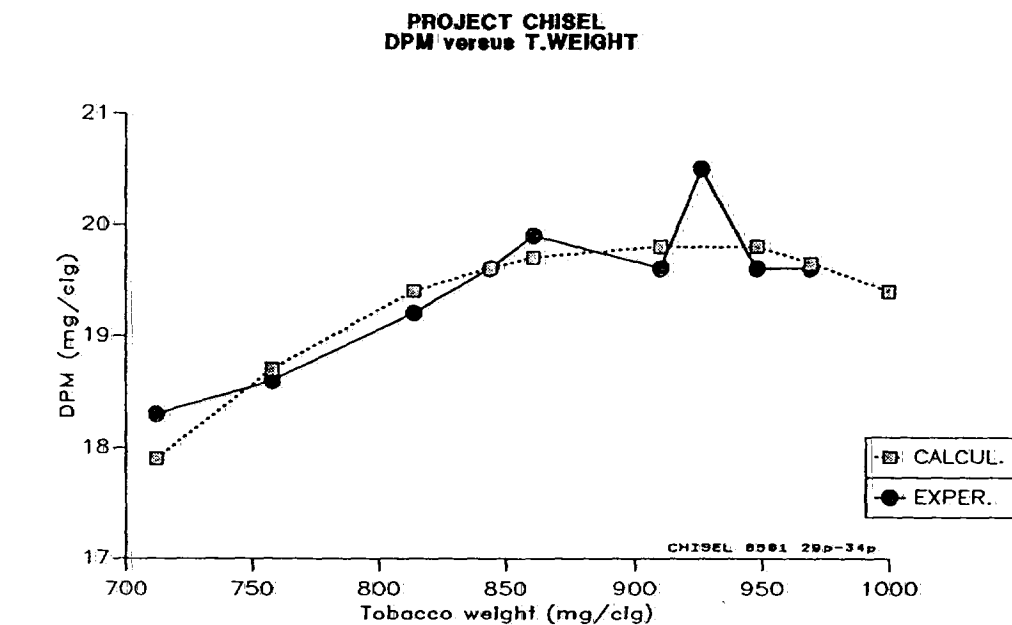
Figure 5b

**PROJECT CHISEL**  
**NICOTINE / PUFF COUNT versus**  
**T.WEIGHT**



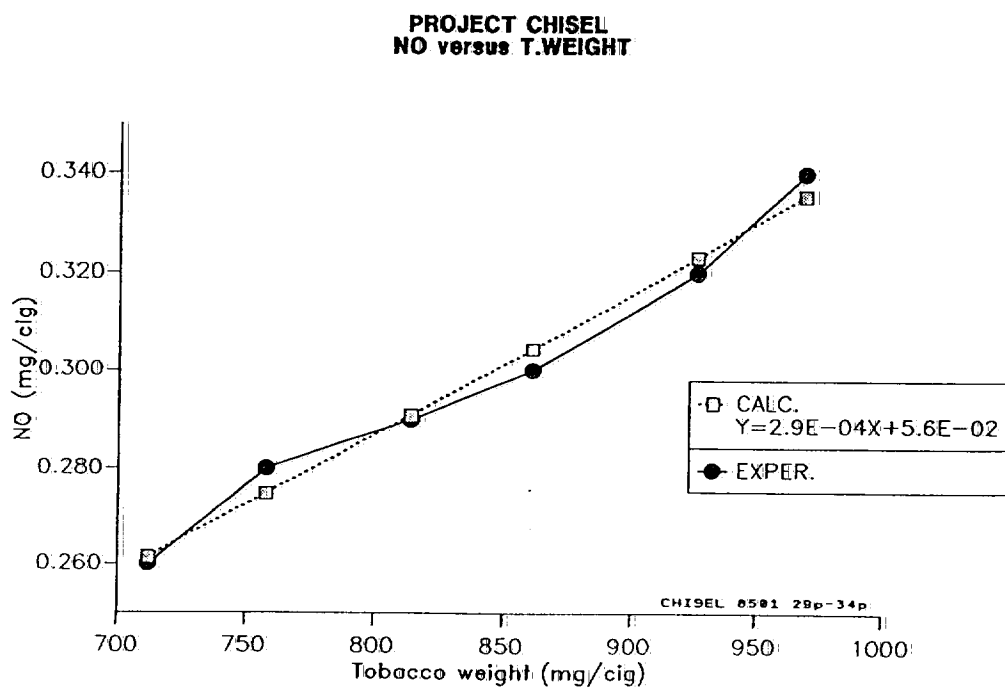
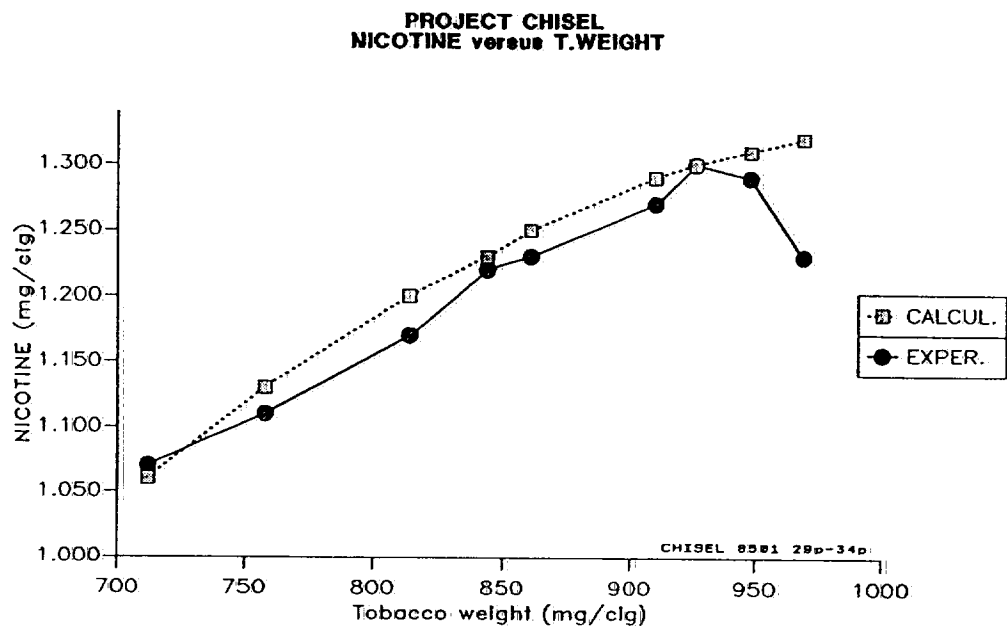
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Figure 6a



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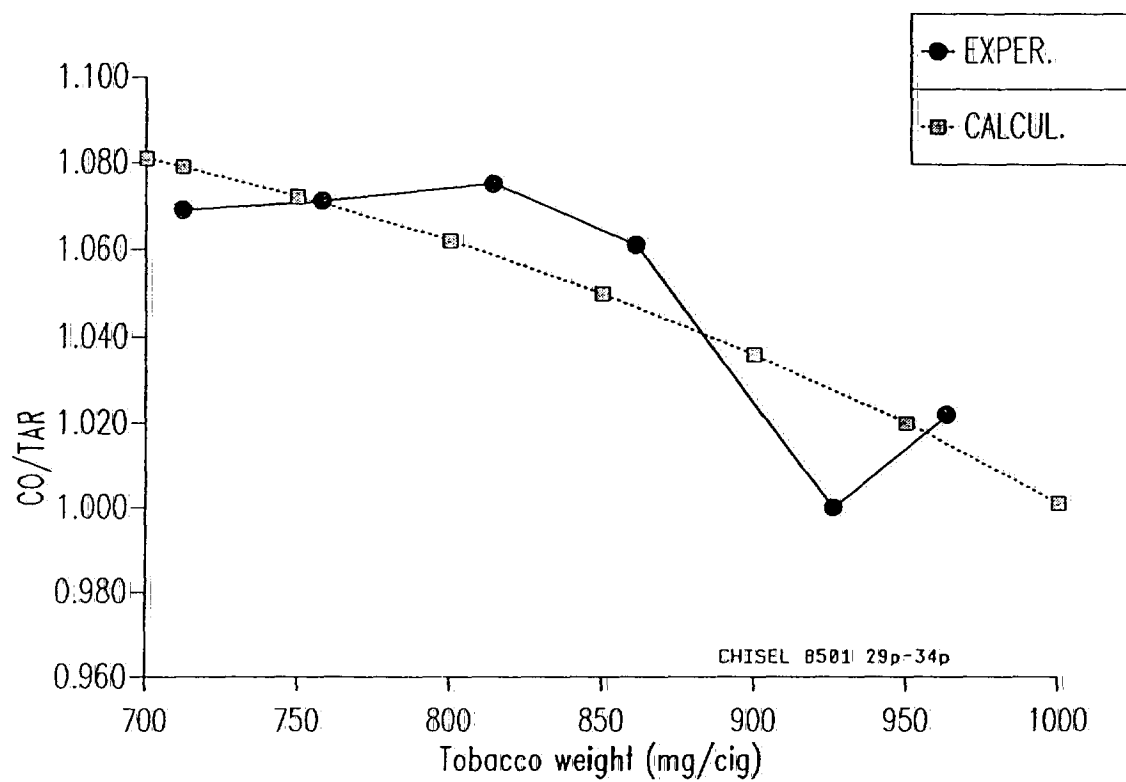
Figure 6b



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Figure 6c

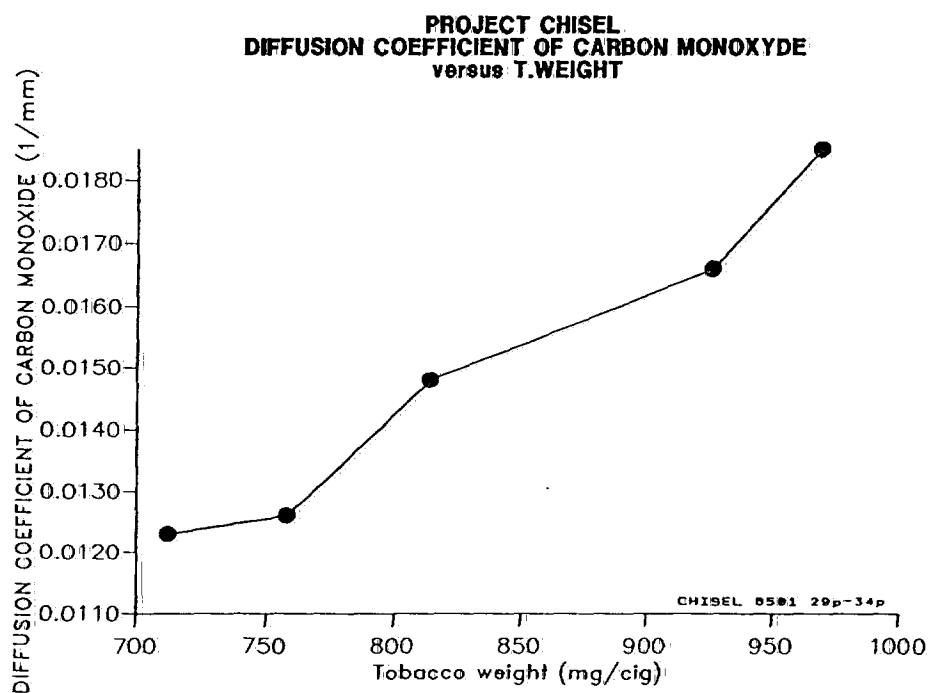
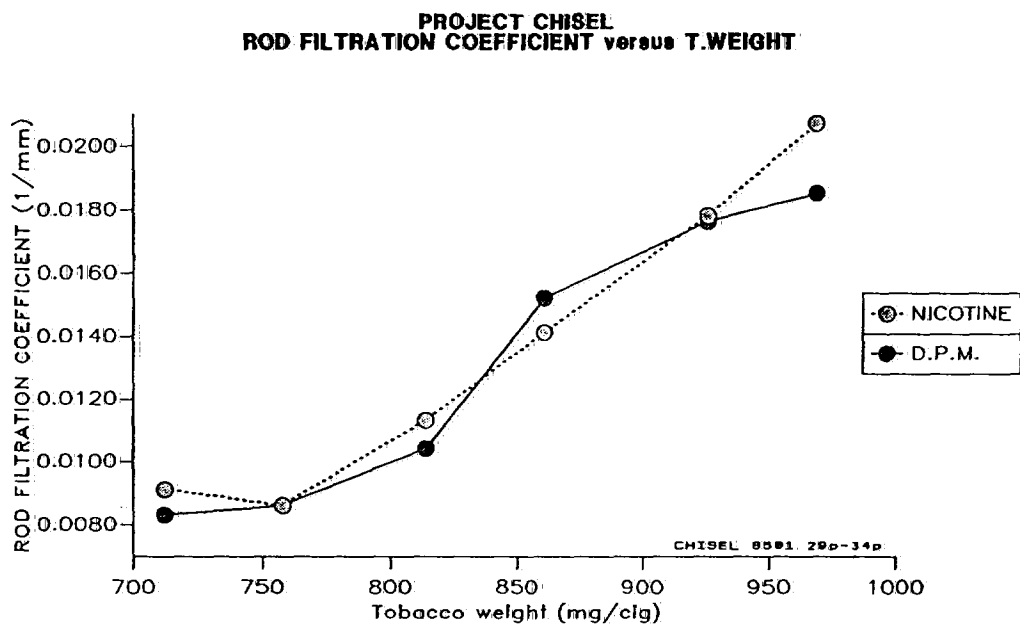
# PROJECT CHISEL CO/TAR versus T.WEIGHT



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Figure 7a



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Figure 7b

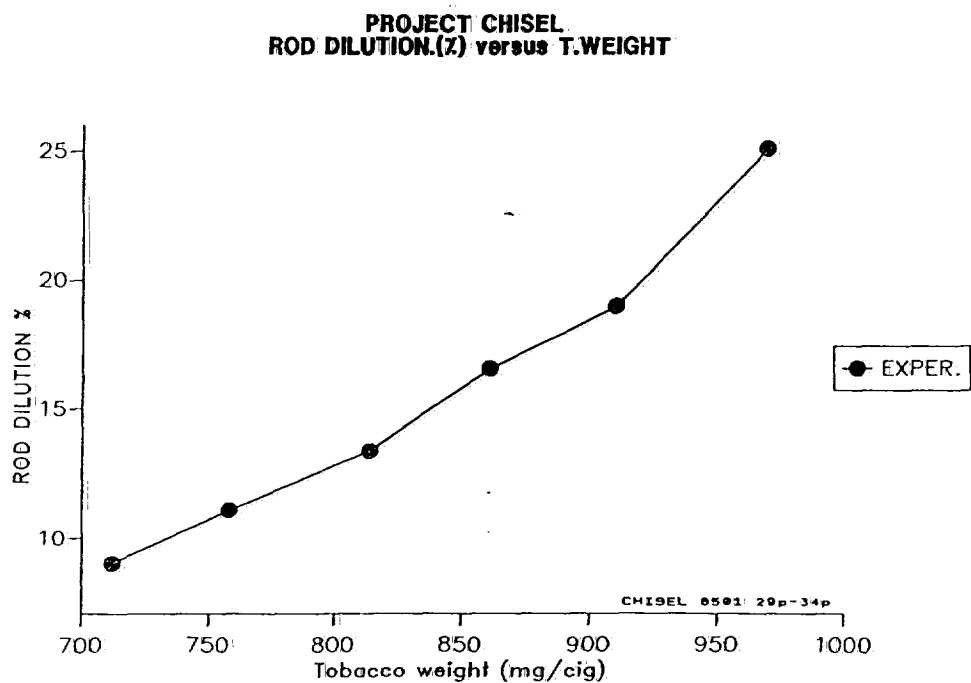
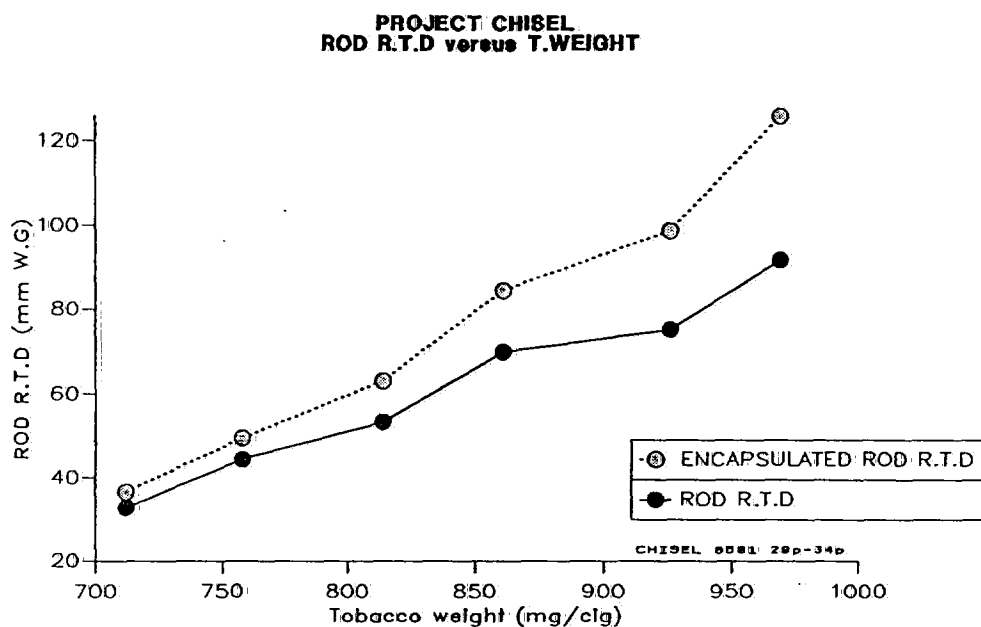
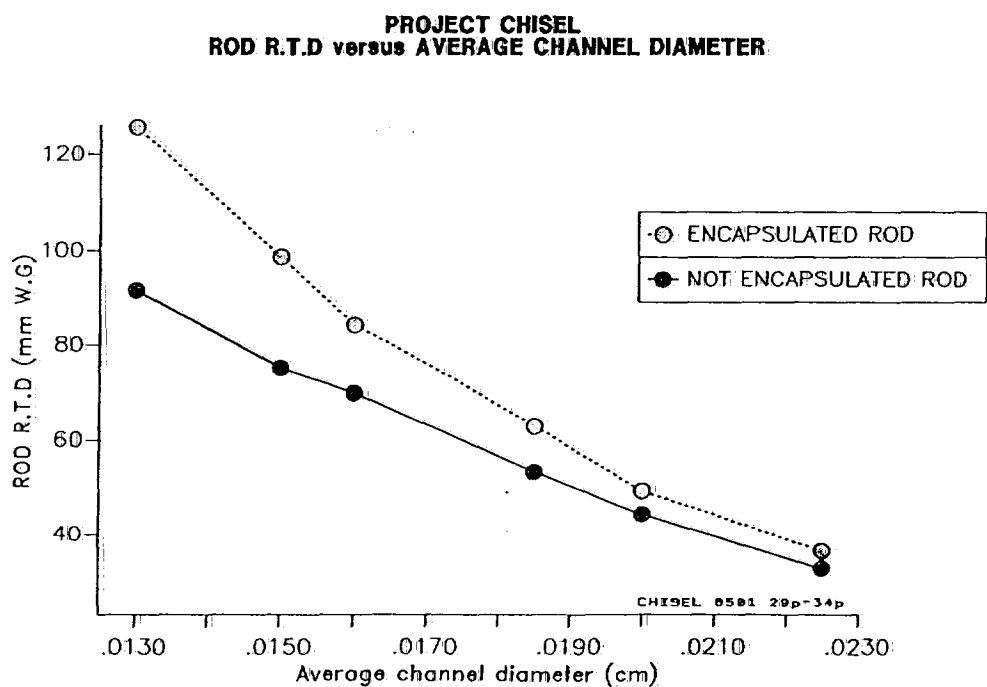
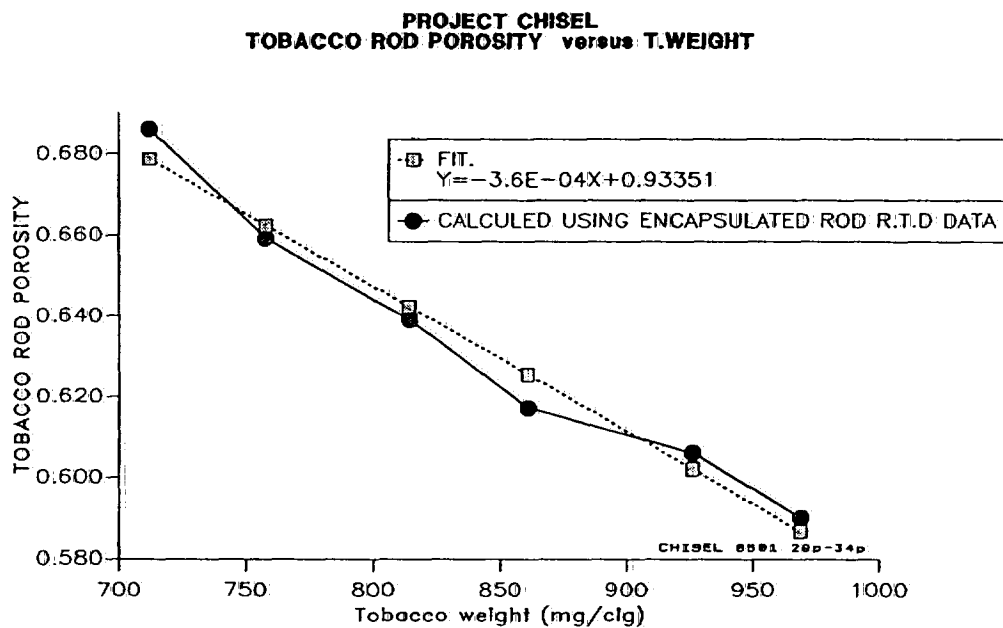
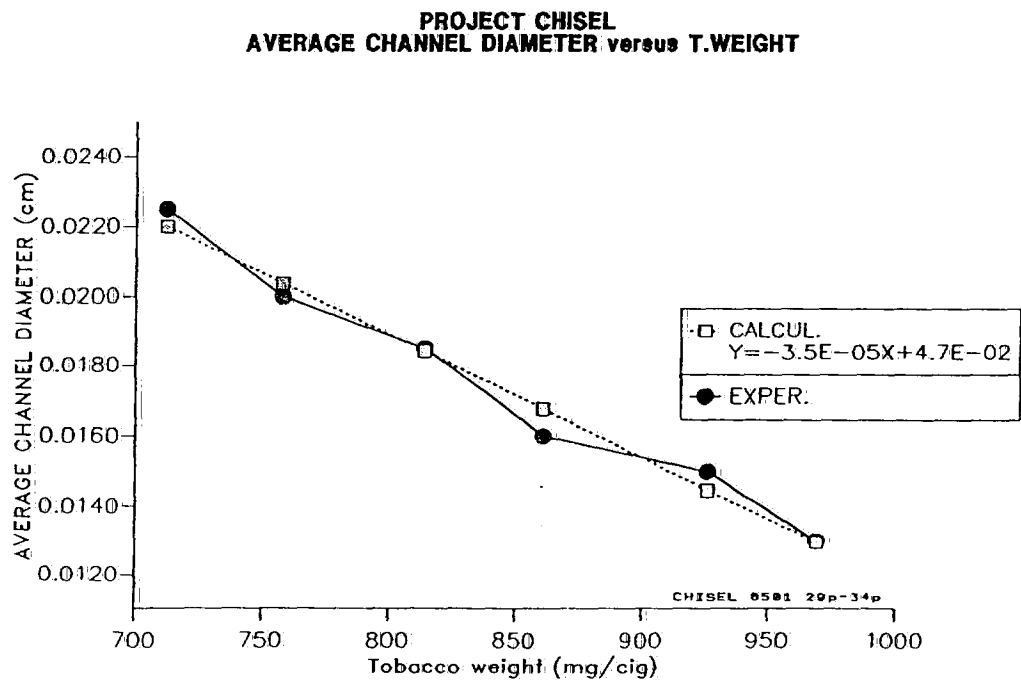
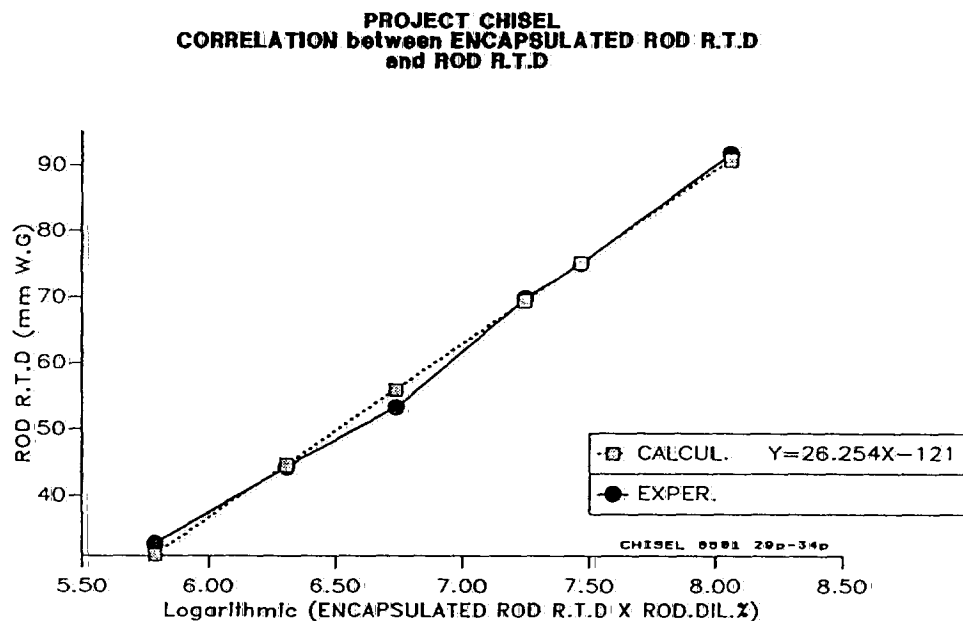


Figure 7c



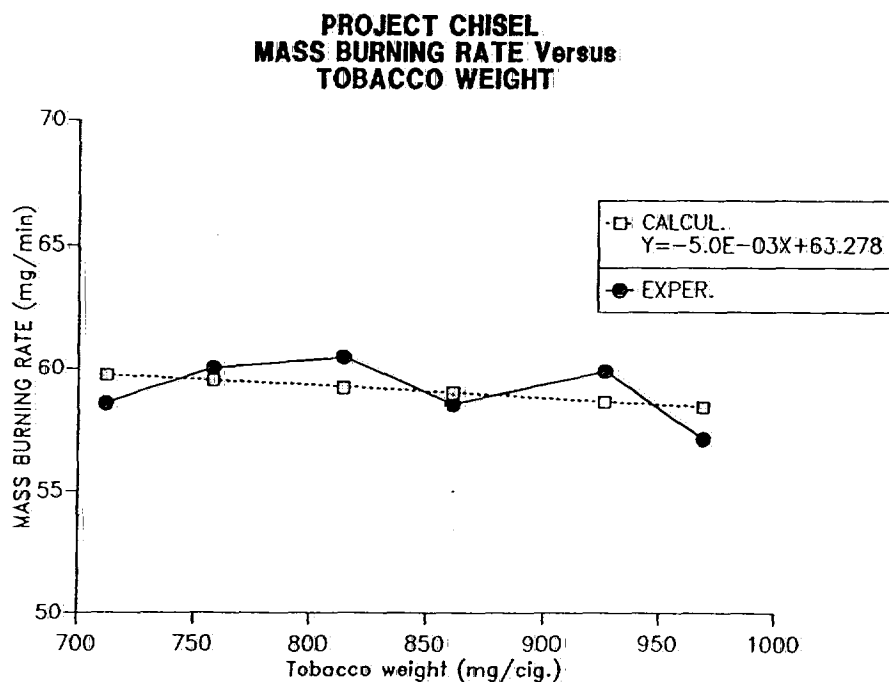
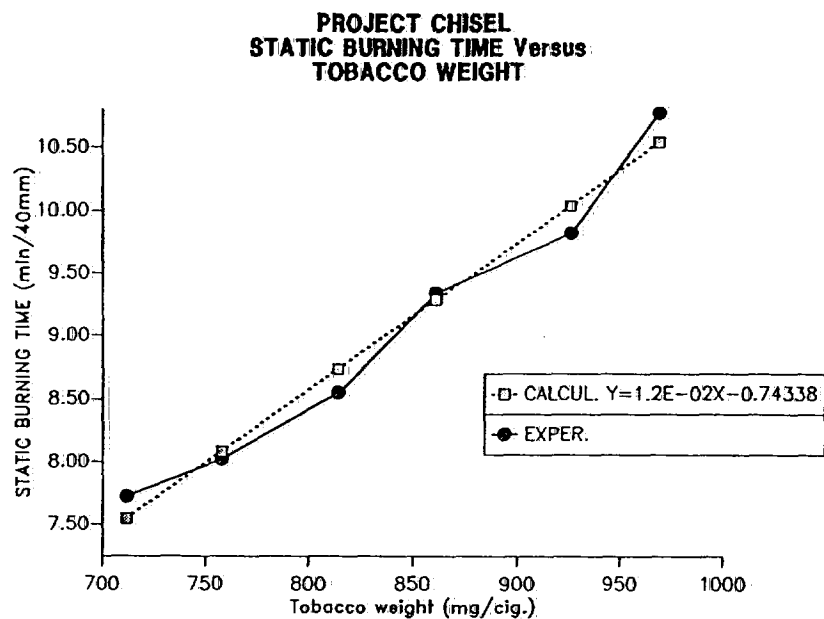
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Figure 7d



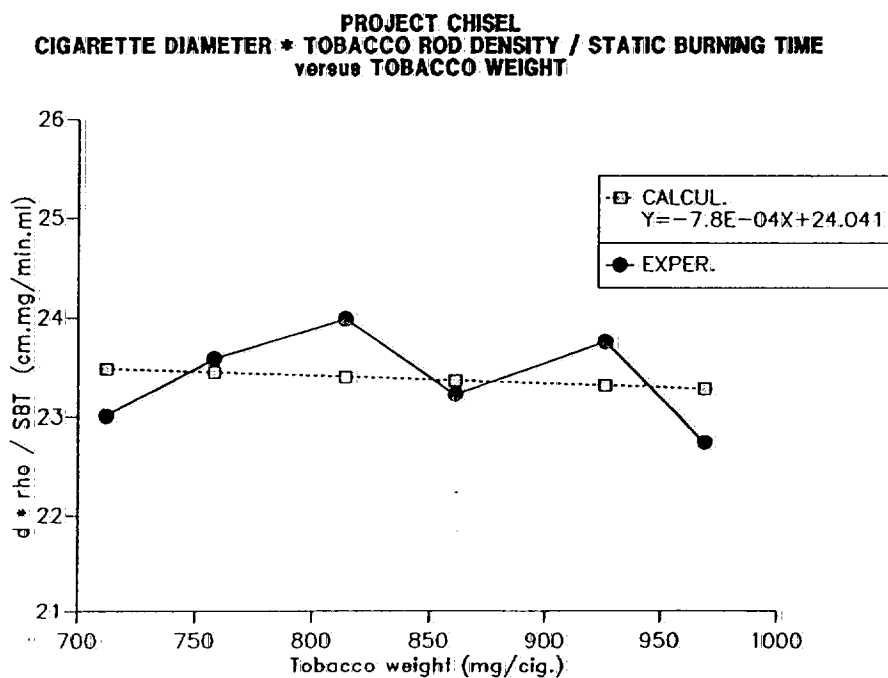
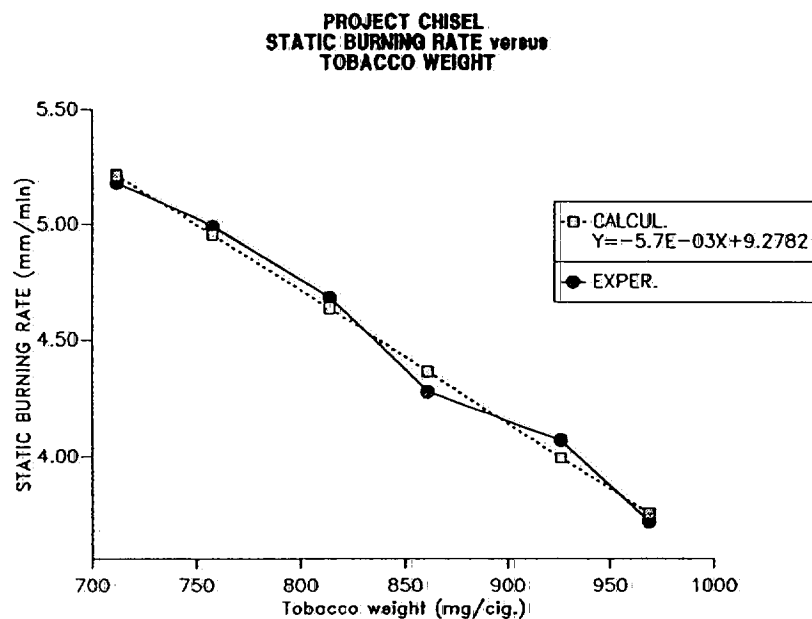
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Figure 8a



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Figure 8b



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QUALITY ASSURANCE

RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : QUALITY ASSURANCE + TECHNICAL SERVICES  
SUBJECT TITLE : MATERIAL TESTING  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Kuersteiner-C. (CHK)  
KEYWORDS : base, esp, maglio, plug, wrap

---

INCOMING INSPECTION FOR FTR

The incoming inspection of non-tobacco materials used by FTR gave the following results :

- 466 deliveries were inspected
- 10 deliveries were found noncompliant

The noncompliant deliveries were only packaging materials.

QUALIFICATION TRIALS

Qualification trials for cigarette and packaging materials carried out during the reporting period were guided by the objectives of :

- improving Product quality
- standardizing materials used in Europe
- evaluating alternative suppliers.

Plug Wrap

The Dexter-plug wrap-paper quality 2493 being of an old design, it was decided to develop in common (R&D and Dexter) a new paper with new specification targets based on optimal "runnability" and final product quality.  
An initial trial with five different versions was tested. Positive "runnability" results were obtained. An industrial trial has just started.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### Plug wrap

An industrial trial was made with plug ex Mauduit. Due to water-absorption variations, mainly due to process fluctuation at Mauduit, it was decided to rediscuss this point with the supplier and wait for the results of the trials performed at the other affiliates before finalizing the technical sheet.

### Soft labels

1. A confirmation trial was performed on the MPH-CH brand with the newly developed base-paper ex Biberist tested previously on the BRD brand. The trial was positive and showed good "runnability" improvements. This base paper will therefore also be introduced on the MPH-CH brand.
2. To improve the "runnability" characteristics of the MAK-CH brand using a very glossy base-paper, various basic paper executions without print, with higher and lower grammage, different suppliers, different grain direction and specially scored labels, were tested on a production machine. Most trials were negative except the trial using labels manufactured on long grain instead of short grain. It is planned to make an industrial trial with the Flint Brand, due to the fact that it is offset printed instead of gravure. Should the trial be positive, a set of printing cylinders will be ordered for the MAK brand.

### ASSISTANCE TO LICENSEES AND HEADQUARTERS

---

A technical sheet and all complementary information needed to produce cigarette paper according to PM requirements were sent to the Italian supplier Maglio. It is planned to introduce this paper on the brand Diana.

Various tests were performed on request for EEC and EEMA headquarters.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### SUPPLIER CONTACT

Following various improvements made on the Mauduit and Dexter plug wraps, it was planned to standardize also the Schoeller and Hoesch plug wrap. A presentation was given to this supplier explaining the reasons why PM had to request a new plug wrap. Three new versions of plug wrap have already been submitted.

### Special Projects

Additional electrostatic perforation trials were performed on the ESP unit installed at FTR Onnens. The trials confirmed that this unit gives variations outside PM acceptable limits, thus significantly influencing cigarette ventilation.

*in. Obaufrecht*

CHK/July 12, 1990  
mt290.QR

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : QUALITY ASSURANCE + TECHNICAL SERVICES  
SUBJECT TITLE : CIGARETTE AND SMOKE ANALYSIS  
PERIOD COVERED : April - June 1990  
WRITTEN BY : SENEHI-F. (SEF)  
KEYWORDS : BARCLAY, CH, LGC, GB, LNE, FR

---

BARCLAY ULTRA LIGHTS 84/F SOLD IN SWITZERLAND

New BAT brand launched in the Swiss market with a conventional filter (double filter) without channel ventilation.

Smoke deliveries determined on 120 cigarettes showed results on the high side for tar but still just within tolerance limits.

Values found	Tar/SN	=	2.9 / 0.25
Printed numbers	Tar/SN	=	2 / 0.2
Limit values	Tar/SN	=	3 / 0.3

DATA FROM THE OFFICIAL UK LABORATORY (LGC) (Appendix 1)

A list was established showing the tar, smoke nicotine and CO values of six PM brands analysed by LGC during a six-month period in 1989-1990, compared with the results obtained by QA-PME on parallel samples (Survey 30 covering the period October 89 - March 90). The cigarettes were analysed by the two laboratories according to UK norms (1).

For brands Marlboro KS and 100's, Raffles KS and 100's, the UK butt length is 1 mm more than the ISO butt length. For Marlboro Lights KS and 100's, the UK butt length is 2 mm more than the ISO butt length.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### Comments

1. All our brands complied with the UK Legislation.
2. Tar values found by LGC were comparable to those obtained by QA-PME, whereas smoke-nicotine values were higher and CO values slightly lower.
3. Deviation in smoke nicotine remains constant for the last three Survey where LGC found systematically 0.1 mg higher results than PM. Deviations between the different manufacturers in UK should be discussed in the framework of the Scientific Liaison Committee meeting.

### DATA FROM THE OFFICIAL FRENCH LABORATORY (LNE) (Appendix 2)

As mentioned in the last quarterly report, all PM brands have been tested by LNE for 1989 and all complied with the regulations, i.e. they were all within tolerance limits.

### Comments on these results (2)

1. On average, tar values obtained by LNE were systematically lower than those found by PME, whereas smoke-nicotine values were equivalent.

#### DEVIATIONS IN PERCENT

	<u>1989</u>	<u>1988</u>	<u>1987</u>	<u>1986</u>	<u>1985</u>	<u>1984</u>
TAR	- 10.6	- 6.1	- 6.4	- 4.0	- 1.5	0.0
SN	+ 1.1	+ 12.6	+ 10.7	+ 7.2	+ 3.4	+ 11.9

2. Smoke nicotine deviations between the two laboratories were considerably reduced in 1989 in comparison with 1988 and 1987.
3. The increase in tar deviations between the two laboratories in 1989 (-10.6%) compared with 1988 (-6.1%) is mainly related to the fact that LNE found, on average, higher water values in smoke than PME (tar = TPM minus water minus nicotine).

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT


### PRODUCT REPORTS

Product reports were written for the following new brands:

BRAND	PRINTED VALUES	MANUFACTURER	COUNTRY OF SALE
Gauloises Légères KS/F	Tar/SN = 7.5/0.70	Cinta	Belgium
HB Lights KS/F	Tar/SN = 6/0.6	B.A.T.	West Germany
Kim Ultra 100/F	Tar/SN = 4/0.3	B.A.T.	West Germany
Peer Lights KS/F	Tar/SN = 6/0.4	Brinkmann	West Germany
Vogue Superslims 100/F	Tar/SN = 7/0.7	Brinkmann	West Germany
MS De Luxe 100/F	DPM/SN = 7.0/0.60	Monital	Italy
Fjodor 100/F Gorbatchow KS/F	Tar/SN = 12/0.9 Tar/SN = 16/1.1	Sullana Imported by Four- Seasons	Switzerland Switzerland

### REFERENCES

1. Report by Senehi-F. dd. May 31, 1990
2. Report by Senehi-F. dd. July 5, 1990



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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

Appendix 1

COMPARATIVE RESULTS BETWEEN LGC AND PME (SURVEY 30)

	Tar [mg/cig]		SN [mg/cig]		CO [mg/cig]	
	<u>LGC</u>	<u>PME</u>	<u>LGC</u>	<u>PME</u>	<u>LGC</u>	<u>PME</u>
Marlboro KS	13.41	13.97	1.02	0.94	12.41	13.22
Marlboro 100's	14.56	14.83	1.18	1.07	14.98	15.63
Raffles KS	13.53	13.58	1.37	1.27	14.03	14.32
Raffles 100's	13.56	13.25	1.37	1.24	16.33	16.73
Marlboro Lights KS	8.57	8.30	0.68	0.59	9.86	10.33
Marlboro Lights 100's	<u>8.55</u>	<u>8.75</u>	<u>0.73</u>	<u>0.65</u>	<u>8.80</u>	<u>9.35</u>
Average Survey 30	12.03	12.11	1.06	0.96	12.73	13.26
Average Survey 29	12.17	11.99	1.02	0.93	12.86	13.17
Average Survey 28	12.15	12.00	1.02	0.92	12.74	13.60

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COMPARATIVE RESULTS BETWEEN THE OFFICIAL FRENCH LABORATORY (LNE) AND QA PME (1989)

B R A N D S	Values printed on pack		Limit values		L N E		Q A P M E		Difference LNE - QAPME	
	TAR	SN	TAR	SN	TAR	SN	TAR	SN	TAR	SN
ARMADA GALION 100'S	15.9	1.09	18.3	1.25	14.9	1.12	16.0	1.13	- 1.10	- 0.01
ARMADA MENTHOL 100'S	15.9	1.09	18.3	1.25	13.7	1.08	15.5	1.07	- 1.80	+ 0.01
CHESTERFIELD REGULAR NF	17.5	1.29	20.1	1.48	16.0	1.35	16.6	1.24	- 0.60	+ 0.11
CHESTERFIELD KS NF	19.9	1.55	22.9	1.78	18.7	1.55	19.9	1.50	- 1.20	+ 0.05
CHESTERFIELD KS EXPORT	14.9	1.14	17.1	1.31	13.4	1.09	15.1	1.09	- 1.70	+ 0.00
FORTUNA	14.9	0.95	17.1	1.09	13.9	1.01	14.9	0.99	- 1.00	+ 0.02
MARLBORO BOX	14.9	1.09	17.1	1.25	14.4	1.09	15.4	1.06	- 1.00	+ 0.03
MARLBORO K.S. SOFT	14.9	1.09	17.1	1.25	14.2	1.06	15.8	1.08	- 1.60	- 0.02
MARLBORO MENTHOL KS	14.9	1.09	17.1	1.25	14.6	1.06	15.8	1.04	- 1.20	+ 0.02
MARLBORO 100'S SOFT	16.9	1.20	19.4	1.38	14.3	1.09	16.0	1.10	- 1.70	- 0.01
MARLBORO 100'S BOX	16.9	1.20	19.4	1.38	13.8	1.08	16.3	1.12	- 2.50	- 0.04
MARLBORO LIGHTS 100'S	10.8	0.80	12.4	0.92	9.3	0.81	11.0	0.80	- 1.70	+ 0.01
MARLBORO LIGHTS KS	9.6	0.70	11.0	0.81	7.6	0.63	8.9	0.63	- 1.30	+ 0.00
MERIT	7.5	0.56	8.6	0.64	6.1	0.57	7.4	0.55	- 1.30	+ 0.02
MULTIFILTER 100'S	12.9	0.95	14.8	1.09	9.7	0.83	11.2	0.84	- 1.50	- 0.01
MURATTI AMBASSADOR BOX	12.9	0.95	14.8	1.09	11.5	0.90	12.9	0.91	- 1.40	- 0.01
MURATTI AMBASS. EXTRA MILD	7.8	0.68	9.0	0.78	6.7	0.63	7.7	0.60	- 1.00	+ 0.03
PHILIP MORRIS FILTER KINGS	14.9	1.09	17.1	1.25	14.4	1.12	16.1	1.12	- 1.70	+ 0.00
PHILIP MORRIS LIGHTS KS	9.5	0.70	10.9	0.81	8.1	0.68	9.4	0.69	- 1.30	- 0.01
PHILIP MORRIS SUPER LIGHTS KS	3.9	0.40	4.5	0.46	3.1	0.32	4.0	0.32	- 0.90	+ 0.00
PHILIP MORRIS 100'S S.L.	4.5	0.40	5.2	0.46	3.8	0.39	4.4	0.37	- 0.60	+ 0.02
PHILIP MORRIS ULTRA LIGHTS KS	1.3	0.17	1.5	0.20	0.9	0.14	1.6	0.16	- 0.70	- 0.02
GENERAL AVERAGE	12.4	0.92	14.3	1.05	11.05	0.89	12.36	0.88	- 1.31	+ 0.01

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : QUALITY ASSURANCE + TECHNICAL SERVICES  
SUBJECT TITLE : TOBACCO MONITORING  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Orsan-G. (GUO)  
KEYWORDS : tobacco, monitoring, tla, tga, expanded,  
audit, hunt, combet, sting, nile, maria,  
spencer, pissaro, threshing line, cleveland,  
europe, mo, ati, cutter, database, throughout.

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TOBACCO LOT ANALYSIS (TLA)

ASSISTANCE TO THE PM-EEC LEAF DEPARTMENT

In the context of project HUNT, whose scope is the determination of an optimum cutting width and length for tobacco, the following trials were carried out for the period reported:

- April 5, 1990 : Two trial versions and a control. For the three batches, cigarettes were produced with two firmness targets. These were 3mm/30s and 3.25mm/3min.
- June 6, 1990 : Five trial versions and a control. Two firmnesses for each batch as above.

All cigarettes (7 trial versions and 2 controls) were submitted to complete TLA analysis. In addition, several determinations of firmness and filling power were carried out on selected cigarettes. All the results were transmitted to the department concerned.

Plans

For the time being, no further trials are foreseen.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### ASSISTANCE TO THE PM-EEMA LEAF DEPARTMENT

In the context of project COURBET, two lots of Moroccan sun-cured tobacco strips were prepared at the R&D miniprimary. These two lots were from the same tobacco grade but different threshing processes were used to obtain the strips. The aim of this additional test was to compare the vertical threshing system (Hauni) used in Morocco with the conventional horizontal threshing plant in Fermenta-Payerne, in relation to machinability and tobacco yields.

Below are listed some of the parameters checked during the machinability trial, together with the results obtained for each of the two versions. Note that identical quantities of tobacco were used to perform this test (e.g., 42 kg) and the cigarette maker setting remained the same.

	<u>TOBACCO THRESHED IN MOROCCO</u>	<u>TOBACCO THRESHED FERMENTA</u>
Net tobacco weight (corrected to 12.5% OV and 3.00/30s)	757 mg	761 mg
Theoretical number of cigarettes which could be produced	55'250	54'540
Machine yield	74.6 %	87.4 %
Number of machine stops	17	9
Number of cigarettes produced	35'000	46'000

Even if the corrected net tobacco weights needed to obtain a given firmness were almost identical, the experiment showed that the tobacco threshed in Payerne had a slightly better machinability. This can be directly linked to the difference in stem content between the two versions (in strips: stem > 3/32" (OBS)): 0.72% for Fermenta vs 3.40; total stems: 6.98% for Fermenta vs 10.97).

All the results were transmitted to the department concerned.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### ASSISTANCE TO OTHER R&D SERVICES

1. Thirty-six tobacco samples were cut in order to enable further determination. This work was requested by the Microbiology group in the context of project EUROPE.
2. Cigarette rods containing Flue-cured and Oriental tobacco were prepared and sent to R&D Infestation Control (JMF). These cigarettes rods will be used in the context of a study on beetle control by deep-freezing.
3. In the context of project CLEVELAND, 2 samples (one before expansion and one expanded) were submitted to a complete TLA analysis.
4. In the context of project NILE, 2 samples (one before expansion and one expanded) were submitted to a complete TLA analysis.
5. In the context of project PISSARO, 3 samples (one before expansion and two expanded) were submitted to a complete TLA analysis.
6. In the context of project MARIA, 3 samples (one before expansion and two expanded) were submitted to a complete TLA analysis.
7. In the context of project SPENCER, 8 samples (2 before expansion and 6 expanded) were submitted to a complete TLA analysis.

### TLA DATABASE

On the request of PME-LEAF Department, the following modifications were made to the TLA database for PME standard tobacco lots:

1. Oriental IA/IB/IC

Based on the affiliates' end of May inventory, a list of all Oriental lots bearing IA/IB/IC has been issued. This list showed the lot number, the new description (A/B/C) and the new TM code.

All lots IA/IB/IC not reported any more in the inventory were erased from the TLA database.

2. All Oriental, Burley and Flue-cured of the 86 crops and from selected origins have been erased from the database.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

3. All US-Burley and US-Flue-cured tobacco lots bearing packing form STS have been modified to show STR and linked to their corresponding TM codes.
4. LTR lots with the modified grammage have been linked to the new TM code 824.

### Follow-up

A list of semifinished lots to be updated/deleted will be prepared by the Leaf Department and transmitted to the TLA group for action.

### TLA EQUIPMENT

During the period reported, our TLA cutter (Messerli Intimus 007) had to be repaired five times, which led to losses of production capacity.

### TLA LABORATORY PROCESSING CAPACITY BY MID-1990

The target assigned to R&D for TLA in 1990 is to process 1000 samples during the year. The situation after six months is shown here:

### TLA SAMPLES THROUGHOUT

	Received y.t.d.	Processed y.t.d.	Finished y.t.d.	Stock
June 90	569	605	475	57
June 89	549	611	505	243
Dec. 89	887	<u>1054</u>	1050	93

In comparison with the same period of 1989, the number of samples in stock decreased significantly from 243 to 57. The number of samples received remains the same as well as the number of samples processed.

If everything continues like this, we will be in a position to fulfill the assigned target for TLA.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### TOBACCO QUALITY AUDIT (TQA)

The audit program consists of the physical analysis of offshore flue-cured and Burley tobacco strips for:

- strip-size distribution
- stem content and size
- oven volatiles
- net tobacco-weight

The objective is to provide the PME Leaf Buyers with the necessary information to identify tobacco processors in need of processing improvements, by comparing the obtained audit results of the different tobacco processors per country and setting specifications for the audited parameters by grademark, tobacco type and origin.

#### Status

The following tobacco purchases were audited and the respective audit reports transmitted to the PME Leaf Department:

1989	Germany	(1 FC)
1989	Hungary	(1 FC)

The following tobacco purchases were audited but the respective report has not yet been issued:

1989	Italy	(4 FC)
1989	France	(3 FC)
1989	Yugoslavia	(1 FC)
1989	China	(3 FC)
1989	Thailand	(4 BU)

#### Plans

Start the audit of the following countries:

Poland  
India  
Korea  
Argentina

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : QUALITY ASSURANCE + TECHNICAL SERVICES  
SUBJECT TITLE : ANALYTICAL SERVICES  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Turpin-D. (DAT)  
KEYWORDS : chocolate, cocoa, humectants, sugars,  
sorbitol, seam glue, filter glue, tipping  
glue, licorice, menthol, methods.

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### 1. ASSISTANCE TO FTR

#### 1.1 INCOMING INSPECTION

The objective of incoming inspection is to ensure the constant quality of ingredients, filter additives and glues used by FTR, as well as conformity to PM specifications. During the reporting period, 128 deliveries were checked.

Two were replaced by the supplier due to machinability problems:

Lesso 1794/1 filter glue from Laesser (Nos 6552 and 6617). Since the analyses did not show any formulation difference from references, trials were made with samples deliberately altered by the supplier according to the possible errors in production process. They showed that problems were likely to be due to a negative effect of the storage period on the glue rheology and not to a defective production process. Investigations are under way for confirmation.

#### 1.2 FOIL-MENTHOLATING

Menthol content was routinely determined:

- on alu-foil for 27 various productions of mentholated bobbins for FTR and export
- on cigarettes for 10 various productions of FTR mentholated brands.

All results complied with specifications.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### 1.3 SPECIAL PROBLEMS

#### Standardization of menthol solutions

Trials were included in project MONKEY. They are under way and deal with both the dose and type of menthol solution for mentholated Marlboro.

#### Storage of mentholated bobbins

Trials are under way to check whether the maximum limit of storage period may be extended from 4 to 6 months.

### 2. ASSISTANCE TO AFFILIATES

#### Menozzi block licorice used at PMH

Due to repeated filters blocking when pumping solutions at the Primary, deposits taken from the filters were examined. They were identified as hard-to-dissolve licorice fragments. Investigations pointed out, that due to defective thermostating during the production of the licorice extract, they had formed on the vat wall and contaminated the lot. Excessive heating will be avoided by the supplier for future productions.

#### Stability of PMS-AC at PMH

Due to sedimentation during storage of PMS-AC, studies have been made to modify the recipe in order to obtain a stable and homogeneous PMS-AC solution. Further to proposals from Richmond flavor specialists, a test is planned within the next three months.

#### Procedure for the detection of PVC in materials at PMB

A quick qualitative test was developed for the detection of PVC in non-tobacco materials in order to check their compliance with the legislation. The procedure was sent to PMB.

#### Specifications of ingredients and filter additives

A revision is under way to set up a pan-European system of incoming inspection. Critical parameters were defined. Specifications drafts were finalized and distributed to the suppliers by Purchasing.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

Interlab testing is under way with F&C for the inspection of licorice powder. Tests with other suppliers will be initiated during the next three months.

### 3. ASSISTANCE TO HEADQUARTERS AND LICENSEES

#### Chloride in tobacco

Chloride content was determined in 54 tobacco samples from various origins.

#### RL-Yugoslavia

Humectant- and sorbitol-content determinations were made on various samples as assistance to the Yugoslavian foil producer.

#### Librokol C: PVA cigarette seam glue from Karbon - Yugoslavia

The above glue was evaluated with the aim of switching to the nozzle application for PM production under licence. Unacceptable traces of phtalate were detected. Trials were temporarily halted.

#### Glues for the production under licence in Cameroun

In order to avoid trouble switching to the PM specified glues for small productions, those currently used for competitive brands are being evaluated.

#### BET-Export-PC made at FTR for ATO

The possibility to keep the solution at 54°C for a period long enough to process several successive tobacco batches, due to strong crystallisation at ambient temperature, was investigated. The extension of the usual heating period was found to affect the quality of BET-PC. FTR will therefore keep exporting the solution in drums containing the amount required for processing one tobacco batch. The packaging conditions were adjusted to fit the new weight of ATO tobacco batches.

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#### 4. ASSISTANCE TO OTHER GROUPS

##### Analytical Research

Humectant content of seven various RL samples was determined for project ORDER.

##### Manufacturing Services

Base-flavor reference samples from PMI were examined for future incoming inspection.

Samples of export solutions were examined to set safety sheets.

Analyses are being routinely made on Marlboro cigarettes to evaluate the migration of humectants from tobacco to filters and packaging as a function of storage period.

Interlab testing between PME and PM-USA is under way for project AMETHIST. Various samples of flavors and casing solutions are being examined by both laboratories using methods of R&D-USA:

- determination of glycerin and sugars by HPLC
- determination of glycyrrhizic acid by HPLC
- determination of water, ethanol, PG and glycerin by GC.

The results are expected for end July. Another test will be made during the next three months for the determination of vanillin in tobacco.

##### Material testing

Finish-oil content and single denier were routinely determined on samples of tow for incoming inspection by both traditional and infraalyser methods.

Citrate and acetate content of various cigarette paper samples from Wattens and Schoeller & Hoesch was determined in order to check the correlation between suppliers and QA-R&D methods.

In order to evaluate the situation with regard to titanium dioxide in tipping papers, various European competitors' brands were examined. Titanium dioxide was detected in the tipping paper of all samples. Further investigations will focus on the tipping papers of PM brands.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### Process Development

Humectant content of tobacco samples was determined for projects CLEVELAND, MARIA, NILE, ET-PAN-EUROPE, PISSARO, SPENCER and WARHOL.

### Product Development

Determinations of menthol content were made on tobacco rods, filters and smoke of various prototypes for projects ALEX, DIETER and MONKEY.

Additive content of four cigarette-paper samples was determined for project HYENA.

Investigations were made to find a seam glue suitable to the production of filter-cigarillos. Trials with liquid starch Lesso 1487 X3 were successful.

### Product Research

Analyses of humectants, menthol, water, ethanol and sugars were made for the development of an infraalyser method for the quality control of various casing solutions.

Nine samples of various cigarette papers were examined for project NEPTUNE to evaluate the effect of additives and load on the side-stream smoke.

### Quality Audit

Menthol content was determined in PM and competitors' brands for CIR.

Further to a consumer's complaint about Fortuna cigarettes having a slight menthol taste, menthol content of various Fortuna samples from the same market area was determined. Menthol was not detected in the samples.

Humectant content of various Monital MS cigarettes was determined for production cost evaluation.

### Tobacco Monitoring

Humectant-content determinations were routinely made on samples from various tobacco lots.

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## 5. QUALIFICATION TRIALS

A new product is only accepted if it has successfully passed the following tests and trials:

- analytical evaluation to examine product conformity to PM specifications and German legislation
- production of cigarettes and subjective evaluation by Panel B and Panel A.
- machinability trials
- industrial trials

### 5.1 QUALIFICATION OF ALTERNATIVE SUPPLIERS

The following trials were initiated to qualify alternative suppliers of ingredients, filter additives and glues:

- synthetic menthol from TAKASAGO. Analytical and subjective evaluations were successful. Industrial trials are planned for the next three months.
- Propyleneglycol from ARCO-France. Local industrial trials were successful at FTR and PMH. They are under way at PMG.
- Cochise supplied by THORESEN and produced with SUCHARD and LINDT & SPRUNGLI peels. Qualification was finalized at FTR. Local confirmation tests are under way at PMG and PMH. Alternative sources of cocoa peels are being investigated.
- Cochise from NEAL-Bremen. Trials were initiated to qualify an alternative European supplier. Analytical and subjective evaluations were successful. An industrial trial is planned at FTR for the next three months.
- Cocoa powder from NESTLE. Trials were initiated to find an option to the JACOBS powder which will no longer be produced. Analytical and subjective evaluations were successful. An industrial trial is under way at FTR.
- Cocoa powder from DUTCH COCOA, already used by PMH. Qualification was finalized for FTR.
- Chocolate from DE ZAAN, already qualified at PMH. A local confirmation at FTR was successful as far as taste was concerned. However, since this ingredient can only be delivered in 12 kg blocks, FTR is investigating the installation of breaking equipment at the casing kitchen. One ton was ordered for trials.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

- Chocolate liquor. Three suppliers are being evaluated: LINDT & SPRUNGLI, NESTLE and BAKER'S CHOCOLATE GENERAL FOOD. Subjective evaluation is planned for the next three months.
- Swift L 710/16 PVA glue for cigarette seam. Analytical evaluation is under way.

### 5.2 QUALIFICATION OF REPLACEMENT PRODUCTS

The possibilities of solving some technical problems were investigated by replacing currently used ingredients, filter additives or glues:

- Lessoflex B2G gelatin seam glue from LAESSER. Marlboro prototypes were made at PMG-B for the analytical evaluation of the pyrolytic components of gelatin by R&D-USA. This evaluation did not point out any appreciable difference between the smoke of prototypes made with gelatin, starch paste or PVA glue. Panel A approval was confirmed. However, since gelatin requires a special application system, trials were halted. They may be resumed in the future if a liquid natural glue is required and if there is no other option suitable to the currently used nozzle-application system.
- Sichocoll GA 1530 gum-arabic seam glue from HENKEL. Subjective evaluation was not successful. Possible other developments of this glue type will be investigated with the supplier.
- Sichocoll A 7630/600 mp inner-filter glue from HENKEL. An industrial trial is under way at PMG-B to find a glue suitable for both KDF 2 and KDF 3.
- Lessotherm 2088/600 filter seam glue from LAESSER. Trials aimed at improving gluing of highly permeable papers are under way at INM and PMG-M. The resistance during a long storage period is being tested.
- Lesso 1520 A1 tipping glue, same polymer formulation as Lesso 1520 A but with a higher viscosity. Trials are under way at FTR in order to minimize the defects of tipping-paper gluing (seam back-fold).
- Lesso 1517-10 and 1517-11 new tipping glues from Laesser for the same objective as above. Analytical evaluation was successful. Subjective evaluation is under way.

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RESEARCH AND DEVELOPMENT, NEUCHATEL -- QUARTERLY REPORT

6. METHODS

Rheology testing and thermoanalysis are being investigated for the incoming inspection of glues.

Two PME-QA methods were issued:

- No 137, sucrose content determination in ingredients by enzymatic test.
- No 106, refractive index determination of liquids by an Abbe refractometer.

The following method is being evaluated in view of approval as an official PME-QA method:

- No 221, GC determination of menthol and humectants in tobacco and reconstituted tobacco leaf.

Testing is under way to develop methods for:

- sugars content determination in ingredients by HPLC
- sorbitol content determination in tobacco by HPLC
- sorbitol content determination in solutions by HPLC
- determination of glycyrrhizic acid in licorice extracts by HPLC
- fat, water and ash content of cochise by Infraalyser
- glycyrrhizin, ash and water content of powder licorice by infraalyzer.

D. Turpin

DAT/vep/July 13, 1990  
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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : QUALITY ASSURANCE  
SUBJECT TITLE : SUBJECTIVE CIGARETTE EVALUATION  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : MONNIN E. (EMO)  
KEYWORDS : panel, discriminative, consumer, test,  
project, monitoring, assistance

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### DISCRIMINATIVE PANEL

Sixteen tests were carried out by the R&D Panel B during April, May and June 90 using the DDD-method (PME-method no. 720). No significant difference was detected between the control and the experimental cigarette in 13 tests. A significant difference was reported in 3 tests.

Classification of the tests by type of modification :

Tow	5 tests
Cigarette paper	3 tests
ESP- Perforation	2 tests
Ingredients	2 tests
Collaborative tests	2 tests
Glue	1 test
Filter paper	1 test

### CONSUMER PANEL

#### Test C2 90 109

A consumer test using the standard comparison questionnaire was carried out in February at the request of the R&D Manufacturing Services Group (MSG). The purpose of the test was to qualify the tow ex Courtauld on MLK cigarettes. Results obtained revealed that the cigarettes were not perceived as significantly different. (1)

#### Test C1 90 110

A consumer test requested by the R&D MSG was launched in mid-May. The objective was to replace ingredients MPEG 550, MPEG 750 and PEG 600 by triacetine as well as to qualify the tow Rhodia (Project "Carbo") on Brunette Double Filter cigarettes. The report will be issued beginning of July.

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## RESEARCH AND DEVELOPMENT, NEUCHÂTEL - QUARTERLY REPORT

### Test C3 90 111

R&D MSG requested a consumer test for the same reasons as for test C1 90 110 on Muratti Ambassador cigarettes. The test was launched in mid-May. The report will be issued beginning of July.

### PROJECT PANEL MONITORING

#### Methodology

Following the decisions taken in the panel-leaders' meeting (PALEM) in Neuchâtel in January 90, a smoking evaluation session was held in Lausanne 11th April (2). Panel A, local Leaf experts and some QA people participated in this panel session.

The objective was to evaluate the degree of difference between a control cigarette and a prototype using the 1 to 7 point scale. This was repeated for each of the five prototypes produced with this aim in Neuchâtel. The experts also gave a description of each experimental cigarette. These two parameters should help the B-panelists to become more self-confident when evaluating the difference between two cigarettes.

It was also decided that each prototype produced for the collaborative tests, together with the associated reference cigarette, would also be submitted to the consumer panel. Results from the consumer panel ought to give a threshold of discrimination to be achieved by our internal B-panels. Indeed, we expect from our panels that they be at least as discriminative and preferably somewhat more, so than the regular consumers of our brands.

#### Collaborative Test no 8

This test was the first using the training procedure developed during the PALEM meeting in Neuchâtel. The cigarettes submitted were PMU vs PMU with PMS blend.

See table of results obtained :

Panel 1	:	S
Panel 2	:	S
Panel 3	:	NS
Panel 4	:	NS
Panel 5	:	S

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## RESEARCH AND DEVELOPMENT, NEUCHÂTEL - QUARTERLY REPORT

The expected result for this test was : significant difference. Three panels performed acceptably, two panels need to improve. However, one should pay attention to the fact that the cigarettes used for this round of tests are ultra low-tar products. These characteristics caused in fact two problems i) the difficulty to evaluate the difference between two such products because they do not have much taste ii) for the latter reason, the PMU are generally not appreciated by the panelists.

Report on collaborative test no. 8 is under way.

### Consumer test C4 90 112

This consumer test was initiated by the R&D Panel Testing Group at the end of May. The cigarettes submitted were standard MLZ vs MLZ with MAA cut filler. This prototype was subjected to the European B-panels in June as collaborative test no. 9. Results of the consumer test will be available in August.

### Consumer test C2 90 113

This consumer test was initiated by the R&D Panel Testing Group at the end of June. The products tested were standard MLK vs MLK without after cut. This prototype will be submitted to the European B-Panels as collaborative test no. 10 in August. Results of the consumer test will be available in mid-August.

### ASSISTANCE TO ITALY

A visit was paid to the Bologna factory on 15th May. The purpose was to discuss the feasibility of carrying on the training of the Bologna panel this year. The panel leader had to refer to the MONITAL Management for the decision.

The project is pending.

### REFERENCES

- (1) Report on consumer test C2 90 109 by Monnin-E.,  
dd April 9, 1990.
- (2) Minutes of the smoking evaluation session by Monnin-E.,  
dd May 8, 1990.

*E. Monnin*

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : QUALITY ASSURANCE + TECHNICAL SERVICES  
SUBJECT TITLE : INFESTATION CONTROL  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Freymond-J.M. (JMF)  
KEYWORDS : FTR, Infestation control, DIANEX, dust, samples, MTI, program, manual, Rome, Verona, presentation, Papastratos, visits.

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### INFESTATION CONTROL IN FTR

#### Objective

Ensure that the new program including DIANEX application is properly implemented in FTR.

#### Status

During this period, only 12 cigarette beetles were captured on pheromone traps installed in the factory. This shows that the cleaning program and DIANEX applications act effectively in keeping insect population at a low level.

One DIANEX application was made in May. Tobacco dust samples are being collected in the factory, at random, every two months. One sampling was made in February, another one in May. All samples were analysed for their methoprene (DIANEX active ingredient) residue concentrations. Methoprene residues, in each sample, were higher than the lowest efficacy limit of 1 ppm. Detailed results are available (1, 2).

#### Plan

Carry on with the next sampling and DIANEX application according to the following schedule:

July, week 28 : tobacco dust sampling  
August, week 33 : DIANEX application  
September, week 37 : tobacco dust sampling

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### VISIT TO MTI DIRECTION IN ROME

#### Objective

- Present the PM Infestation Control program to the Direction of the Italian Tobacco Monopoly.
- Obtain MTI agreement to implement our program in the factories of PM cigarette production.

#### Status

A presentation of the program was made to the MTI Direction in Rome on May 17, 1990 and was well received. Afterwards, it was agreed that PME R&D would proceed to the implementation of the program in the factories of Verona, Bologna, Rovereto and Florence.

#### Plan

Implement the PM Infestation Control program in the factories (above) of PM cigarette production, starting with Verona. Review and distribute the Manual (by hand) to each local pest-control operator with proper training, during respective visits (to be scheduled).

### VISIT TO PAPASTRATOS FACTORY/WAREHOUSES IN GREECE

#### Objective

- Review the current Infestation Control practices
- Implement the PM Infestation Control program.

#### Status

From May 28 to June 1, a visit was paid to the Papastratos factory/warehouse, where Marlboro under-licence production is made. A presentation of the Infestation Control program was made to the key Papastratos personnel. The presentation was well received.

Also, a complete sanitary inspection and distribution -marking- of pheromone trap positions were made in the Agrinion warehouses and the factory's Primary, Secondary and tobacco stores. Proper recommendations were made in a report (3).

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### Plan

Organize a follow-up visit to Papastratos by mid-1991, together with a PM-USA R&D entomologist to distribute the PM Infestation Control Manual (by hand) to the local Pest Control Operator, and review the program.

### VISIT TO MTI FACTORY IN VERONA, ITALY

#### Objective

- Review the current Infestation Control practices
- Implement the PM Infestation Control program.

#### Status

On June 26-29, 1990, a visit was paid to the MTI factory of Verona, where DIANA (DIS, DIK) cigarettes -under PM licence- are produced.

A presentation of the Infestation Control program was made to the key personnel of Verona factory, the warehouse Managers of Bologna, Rovereto and Florence, and the QC and Infestation Control Managers of Chiaravalle factory (possible future PM production site). The presentation was well received. A complete sanitary inspection and pheromone-trap distribution (marking on factory maps) were made. Proper recommendations were made. A report is being issued.

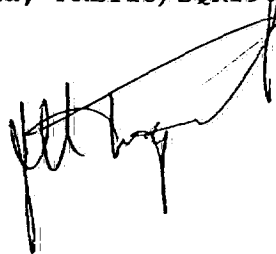
#### Plan

Organize a follow-up visit by mid-1991 to review/distribute (by hand) the PM Infestation Control Manual, with proper training, to the local pest-control operator.

#### References

1. Letter from D. Amati to J.-M. Freymond, FREY17/1QRT90
2. Letter from D. Amati to J.-M. Freymond, FREY18/2QRT90
3. Visit report, vis9021.jmf

July 12, 1990/JMF/vep  
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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : QUALITY ASSURANCE + TECHNICAL SERVICES  
SUBJECT TITLE : QUALITY ENGINEERING  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Henry-P. (HEP), Morelli-M. (MMO)  
KEYWORDS : handbook, visual, quality, audit, pme,  
methods, audio-visual, qa, volga, aging,  
finished product, automatic, tobacco, remover,  
actor, pack, seal, efficiency,imps.

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### HANDBOOK FOR VISUAL QUALITY AUDIT OF FINISHED PRODUCTS

#### Objective

Develop a revised Handbook of Visual Standards for Finished Products jointly with PM-USA. Implementation of the new procedure at PME-QA is planned for January 1st, 1991.

#### Status

##### Packaging standards

PM-USA sent to PME in April 1990 the 250 completed manuals of Packaging Quality Standards.

##### Cigarettes standards

- Final agreement was reached regarding cigarette standards between PME and PM-USA. Comments received from the US factories and from the VQA-PME laboratory with practical experience have been taken into consideration.
- PM-USA has sent the "Generic" cigarette illustrations, and positive comments were made by PME.
- PME has developed a proposal of new weighting factors including documentation explaining how they were set up.
- PME has developed a draft of the inspection procedure including soft pack, hard pack and cigarette.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### Plans

- Develop the EDP application, i.e. data base, sample management and monthly report.
- Submit the proposal of the new weighting factors to the affiliates as well as to PM-USA.
- Proofread the "Good to print" of the cigarette standards (French, Italian, German and Dutch).
- Finalize the inspection procedure and make the translation in French.
- Develop a cigarette support and adapt it to new inspection procedure in order that the auditors eliminate handling cigarettes as much as possible.

### PME METHODS MANUAL

#### Status

Several finalized methods were sent to the holders of a complete manual and reference documents from Manufacturing Services Group were also introduced in the system:

- no 026: laminar test of cigarette papers using ratio-R calculation
- no 056: determination of the capability line of filtration material
- no 771: final inspection report for non-tobacco materials to be used by suppliers
- no 820: guidelines regarding PME specifications for casings and flavor
- no 821: guidelines for producing casings and flavors
- no 822: guidelines for checking casings and flavors
- no 823: guidelines for the ingredient tests to be run before registration in the "usage catalogue".

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### AUTOMATIC TOBACCO REMOVER

#### Objective

Develop an efficient method to recover tobacco from finished cigarettes for further analyses such as cylinder-volume and sieve-size distribution.

#### Status

The series of 8 devices is currently being manufactured by an outside company in Berlin.

#### Plan

All devices will be tested before delivery, which is expected to take place by September/October 1990.

### CHECKING OF AGED FINISHED PRODUCT

#### Objective

Develop regional guidelines on how to check aged finished product in affiliates' warehouses in order to have application of standardized rules.

#### Status

After having taken inventory of current, regional procedures, a draft proposal was sent to the QA managers, PM-EEC and PM-EEMA. We expect comments by August 24th, 1990.

#### Plan

This subject will be finalized during the next QA managers meeting in BOZ in September 1990.

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RESEARCH AND DEVELOPMENT, NEUCHÂTEL - QUARTERLY REPORT

REGIONAL PACK SEAL EFFICIENCY SURVEY

Objective

Carry out a survey in all factories regarding pack-seal efficiency using IMPS tester in order to have a consistent baseline for further discussions and to set objectives.

Status

A sampling plan has been sent to the factories, proposing to test 12 groups in each factory.

Plan

Results will be consolidated in Neuchâtel and presented at the next QA managers meeting in BOZ in September 1990. The deadline to send results is August 31st, 1990.

PROJECT VOLGA

Objective

Install a QA system in Kuibyshev including QA instruments and QA procedures.

Status

A list of QA equipment including price estimates has been prepared and handed over to AOD EEMA.

Plan

Orders will be placed by FTR as soon as we get the green light from AOD EEMA.

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*Morelli*

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MANUFACT. SERVICES



RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : MANUFACTURING SERVICES GROUP  
SUBJECT TITLE : INGREDIENTS, CASINGS & FLAVORS  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Schwarb-A. (ADS)  
KEYWORDS : ingredient, casing, flavor, prototype,  
trial, reformulation, evaluation,  
standardization, guidelines, methods

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1. INGREDIENTS

1.1 Guidelines - Methods (Refs. 1 to 4)

R&D decided that documents such as the Guidelines are to be included in the official book of PME Methods.

Four Guidelines were reviewed, updated and issued as new PME Methods :

1. PME Method No. 820  
Guidelines regarding PME Specifications for casings and flavors  
(Issue No. 2, dated May 11, 1990).
2. PME Method No. 821  
Guidelines for producing casings and flavors  
(Issue No. 4, dated June 20, 1990).
3. PME Method No. 822  
Guidelines for checking casings and flavors  
(Issue No. 4, dated June 21, 1990).
4. PME Method No. 823  
Guidelines for the ingredient tests to be run before registration in the usage catalogues  
(Issue No. 4, dated June 22, 1990).

1.2 Usage catalogues (Refs. 5 and 6)

Updated versions of "Usage of Ingredients" and "Usage of filter additives" were issued on June 29, 1990. In these documents there is a mention of trade name and/or article number per goods and per supplier. When already issued, Material Specifications (MS Nr.) are also given per supplier, and a reference to the PM Technical Sheet is made per item.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### 1.3 Ingredient Specifications - PM Technical Sheet (Ref. 7)

PM Technical Sheets for 8 of the most sensitive ingredients (humectants, cocoa products, licorices and triacetin) were issued and sent to QA of PME Affiliates. A table of the critical parameters to be controlled as Incoming Inspection of these ingredients was attached.

### 1.4 Material Specifications (Ref. 8)

Material Specifications (33) were issued and submitted to suppliers for signatures concerning all goods for which PM Technical Sheets were issued. Duly signed documents and/or comments concerning these Material Specifications are being collected by HQ Purchasing. A synthesis of the supplier's comments will be made and a final version of Material Specifications will be sent to suppliers by the end of September 1990.

### 1.5 Cochise PME Code 10.1250

#### Project ALUNITE No. 5036 - Trial No. 3 (Ref. 9)

The Cochise (ground cocoa shells) from NEAL, Bremen, West Germany was tested in order to find a second European source for this ingredient (alternative to the product from Thoresen).

No significant difference in taste response was detected by Panel A.

The follow-up of this project is to organize an industrial trial at FTR, and if results are positive, to request PMG and PMH to have local confirmation test made.

### 1.6 Ethanol denatured PME code 10.2880

#### Project APATITE No. 5043 - Trial No. 2 (Ref. 10)

This trial is the repetition on an industrial scale of trial No. 1, to prove whether our product quality will be maintained, using MEK (methyl ethyl ketone) as denaturant instead of methanol and Bitrex.

Leaf experts PM EEC & EEMA found a taste difference and therefore they do not recommend implementing MEK as an alcohol denaturant within PME.

The denaturation of alcohol within Philip Morris will be reviewed with PM USA flavor specialists early July during my visit to Richmond.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### 1.7 Burley Process Standardization within PME Affiliates (Ref. 11)

The undersigned collaborates in R&D New Process Development projects for all questions related to casings (formulation, preparation and application).

The specifications concerning the concentrated Burley Spray solution to be used for PMU blends will be reviewed with PM USA flavor specialists during my visit early July. These specifications will be transmitted to R&D New Process Development, Mr. R. Wagoner, project leader in charge of the Burley Capacity Increase Study at PMG.

Concerning FTR, no actions are planned until the existing equipment is improved/replaced.

### 1.8 PMS-AC PME Code 12.2135 (Ref. 12)

Following a complaint from PMH re stability problems with the above-mentioned aftercut, a study was initiated within R&D. A proposal to modify this casing formulation was sent to PM-USA flavor specialists. PM USA proposed a different modification of the existing aftercut recipe, by adding some propylene glycol. According to German legislation, the maximum level of humectants must be below 5 %.

Therefore this change cannot be implemented as such. This new aftercut recipe was given to R&D New Product Development to be included in a trial series of BEAR project together with other standardization proposals of casings and flavors. Results of these tests are expected by the end of August 1990.

## 2. ASSISTANCE TO PME AFFILIATES AND LICENSEES

### 2.1 Flavor Drums ex-PM Richmond

R&D proposed reducing the large number of labels and stickers put on a flavor drum. This proposal is currently being studied by Flavor Specialists and legal entities at PM-USA. Richmond basically agrees with our proposal and is currently investigating the purchase of printing equipment driven by a computer. The target is to get a sticker generated by the computer with all the necessary information directly at the PM USA Flavor Center. This sticker will then be put on each drum before it leaves Richmond. This should be finalized very soon.

### 2.2 FTR - Swiss Customs Requirements (Ref. 13)

R&D answered a request from the Swiss customs concerning PM Flavor 153, to ease up logistics when importing this flavor.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### 2.3 PME - Shelf life of base flavors (Ref. 14)

During the reported period, R&D had to intervene several times because of shelf-life-related problems. It happens very often that orders of base flavors from PM USA are delayed or that they must be used after arrival within a very short time (even 15 days). This subject will be reviewed with PM USA Flavor Specialists during my visit early July, and we will try to issue a procedure to ease logistics.

### REFERENCES

- 1) A. Schwarb "PME Methods Manual - Guidelines regarding PME Specifications for casings & flavors" Issue No. 2 dated June 19 and May 11, 1990.
- 2) A. Schwarb, "PME Methods Manual - Guidelines for producing casings and flavors", Issue No. 4 dated June 20, 1990.
- 3) A. Schwarb, "PME Methods Manual - Guidelines for checking casings and flavors ", Issue No. 4 dated June 21, 1990.
- 4) A. Schwarb, "PME Methods Manual - Guidelines for the ingredient tests to be run before registration in the usage catalogues ", Issue No. 4 dated June 22, 1990.
- 5) A. Schwarb, "Usage of Ingredients" dated June 29, 1990.
- 6) A. Schwarb, "Usage of Filter Additives" of June 29, 1990.
- 7) A. Schwarb, "Ingredient Specifications" dated April 27, 1990.
- 8) Memos from A. Schwarb to Mr. A. Peier dated May 14 and June 22, 1990 "Material Specifications".
- 9) Final report "Project Alunite No. 5036 - Trial No.3" from A. Schwarb dated June 14, 1990.
- 10) Final report "Project Apatite No. 5043 - Trial No.2" from A. Schwarb dated June 14, 1990.
- 11) Memo from A. Schwarb to Mr. R. Wagoner dated July 18, 1990 "Burley Capacity Increase at PMG for PMU PM021-25".
- 12) Memo " Proposition to modify solution PMS - AC (12.2135) " from A. Schwarb dated February 23, 1990 to Mr. E. Cook.
- 13) A. Schwarb, "Dédouannement provisoire No. 1130/207668 du 02.05.1990" dated May 21, 1990.
- 14) Profs note "Shelf life of base flavors" from A. Schwarb to QA and Purchasing of FTR, PMG and PMH, dated May 14, 1990.

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A. Schwarb

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : MANUFACTURING SERVICES GROUP  
SUBJECT TITLE : NON-TOBACCO MATERIALS EVALUATION  
PERIOD COVERED : APRIL-JUNE 1990  
WRITTEN BY : Bel-T. (THB)  
KEYWORDS : material, filter, additive, charcoal, tow,  
plug wrap, tipping paper, cigarette paper

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FILTER ADDITIVES

Project "Carbo"

Objective : Eliminate MPEG 550, MPEG 750 and PEG 600 in all white and black semi-filters manufactured by FTR and INB.

Status : Two cigarette prototypes BRD and MAK-CH were manufactured at FTR at the beginning of May.

BRD-24P : white-semi : 7% triacetine instead of 10% PZ-8-FI  
          black-semi : - black tow 5.0Y/35000 instead of  
                          5.0X/40000  
                          - RC333 charcoal quality instead of  
                          CFT 136-140  
                          - 4% triacetine instead of 8% CA-INM-FI

MAK-25P : same modifications as on BRD-24P

Both prototypes gave expected smoke deliveries and were evaluated by the EEMA descriptive panel. Positive comments came out especially on the BRD prototype.

Both cigarettes were released mid-May for mail-out tests. New MAK prototypes were manufactured at the end of June with two different charcoal quantities.

In parallel, first machinability trials were performed at INB on the KDF2/AF2/AC maker using both new tow and charcoal qualities. Difficulties were encountered with the presence of charcoal particles under the seam.

Follow-up: Final results of both mail-out tests will be available by mid-July as well as the descriptive evaluation of the new Muratti KS-CH prototypes. New machinability trials will be done at INB when a modified tongue from Hauni is received.

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FILTRATION MATERIAL

1. Tow courtaulds 3.0Y/35000

Objective: Qualify this item for Marlboro KS Pan-Europe

Status: Positive results came out from the mail-out test made in Switzerland (D panel) where the MLK prototype using Courtaulds was compared to a standard using Rhodia tow. Three local confirmation tests were made at PMH, PMB and PMG-M. For all tests, we organised local B panels as well as R&D B panels. All six evaluations showed no significant difference between the controls and the prototypes. The tow from Courtaulds was tested against:

- Eastman at PMG-M and PMH
- Hoechst & Celanese at PMB

Follow-up: Consolidated report of all those tests will be published at the end of July. All factories have been asked now to run small industrial tests with 5 to 10 tons of Courtaulds material.

2. Inter-affiliates collective test with Hoechst & Celanese

Objective: Optimise our current material specifications for tow items.

Status: Capability lines were made in 5 production centres with 4 different items produced at Lanaken.

Item: 3.8Y/37000 - 3.0Y/35000 - 2.5.Y/37000 and 2.6Y/42000.

In addition, all physical tests were also done by all our incoming inspection labs. A similar exercise was already done before by the supplier on the same bales.

Follow-up: In mid-July the program will be completed by making the capability lines at INB. Consolidation of all results will be presented and discussed with all affiliates and the supplier, early October.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### 3. Crepe paper for filters

Objectives: Improve the paper quality delivered by Tela. Check the influence of process manufacturing changes (switch from round table to a flat table).

Status: PMU-CH cigarette prototype was manufactured at FTR using the combi-filter produced at INB with the new material. The test cigarette was approved analytically and tastewise. The industrial test made at INB showed some difficulty in reaching the RTD. All results were discussed at a meeting that took place with the supplier.

Follow-up: New samples are expected beginning of September.

### PLUG WRAP PAPER

#### 1. Mauduit PPW 33 (3300 Coresta units)

Objective: Standardise the bobbin winding for all production centres, in order to have the wire side of the paper inside the bobbin.

Status: Two factories (FTR and INB) have already changed and are using now bobbins with the wire side inside.

Follow-up: Three other factories have ordered the material for industrial testing.

#### 2. Mauduit PPW 120 (12000 Coresta units)

Objective: Replace the PPW 140 quality (cost advantages).

Status: Trials made at FTR on the Bond Street family were successful. No difficulties were encountered with all three different types of tipping paper used.

Follow-up: Industrial testing is ongoing at PMH and combi-filters will be manufactured at INB in September to test the "runnability" of the paper.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### CIGARETTE PAPER

#### 1. Mauduit 165 A (100% wood pulp)

Objective: Qualify a second supplier on the Multifilter family.

Status: This paper has been accepted and is now fully qualified.

### TIPPING PAPER (Project "FITIA")

Objective: Improve the gluing of the tipping paper to the filter plug and tobacco rod, on high-speed makers.

Status: A successful test was made at PMG-B on the PMT cigarette using the LS quality from Malaucene.

Follow-up: A confirmation test will be made at PMG-M with the same quality on the PMS cigarette. Another trial will be performed at PMH on Merit 100's with Benkert Blancophan 390 quality.

### MATERIAL EVOLUTION - STATUS REPORT NBR. 47/48

Both above-mentioned reports have been published on May 7 and June 26, 1990 by C. Flury.

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

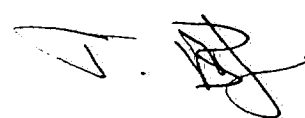
FILTER MANUFACTURING SUPPORT PROGRAM

Objective: Provide technical assistance to the PME factories in order to improve filter consistency and machine efficiency, and to reduce material wastage and manufacturing costs.

Status: Initial discussions took place in all production centres at the end of May with representatives of production, engineering, purchasing and quality assurance.

Consolidated report has been published (ref. 1)

Follow-up: Similar meeting will take place at PM-Spain early July. Official activities with the critical QA methodology group will start in September.



REFERENCE:

1. Filter manufacturing support program / Summary of the initial discussions, by J. Krauss and T. Bel, dated June 27, 1990.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : MANUFACTURING SERVICES GROUP  
SUBJECT TITLE : PRODUCT MODIFICATIONS (LICENSEES)  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Kopp-A.-M. (AMK)  
KEYWORDS : product, specification, monitoring, quality,  
improvement, implementation, modification,  
authorised, planned

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### OBJECTIVES

To monitor product quality and implement cigarette construction modifications when necessary, in order to ensure that the product quality objectives are met.

### PRODUCT MONITORING

A Monitoring Report was issued in June, 1990, covering all Marlboro brands produced by third parties for PM-Europe, as well as Ambassador and Diana cigarettes manufactured in Italy and the major Finnish brands.

Of the 46 brands monitored, 33 (72%) showed smoke deliveries within objectives, 11 had smoke deliveries on the high side and 2 on the low side, mainly concerning smoke nicotine.

#### Action:

##### Products on the high side:

ML KS Austria: A change of printed figures on pack has been proposed.

##### ML 100's Finland:

##### ML Lights 100's Finland

The blend was slightly modified in May. Moreover, prototypes with a new cigarette paper are being evaluated.

ML KS Hungary: A new ventilated version is being planned. Cigarette prototypes will be made in August.

ML Lights LS Egypt: 100% CF-US replaced 100% BB-US by mid-April 1990. Smoke deliveries of May production were within objectives.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### Diana KS Rovereto (Italy):

#### Diana Sp. Mild Bologna (Italy)

Management decision was taken to change neither the specification nor the product. Results obtained for similar products from the Rovereto and Bologna Factories show higher smoke deliveries than those in Verona. This problem is being studied.

L&M LS Finland: Ventilation has been increased twice since January. Analytical results suggest that SN is on target. However, tar tends to be too low. Subject is being reviewed.

Multifilter KS Hungary: Filter construction is planned to be revised.

ML KS Yugoslavia: Blend adjustments are being planned to improve both taste characteristics and delivery numbers.

L&M Lights 100's Hungary: A modified construction is being tested.

### Products on the low side:

L&M LS Hungary: A change of SN target has been suggested.

Bond Street KS: Situation is being reviewed with Area Operations Department.

## MODIFICATION OF PRODUCTS

Belmont Menthol LS Finland: Cigarette has been redeveloped. The new construction started in May together with the introduction of the mentholated alu foil. First analytical results are within the objectives.

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

NEW PRODUCTS

ML Lights KS Hungary: This new Light KS soft version started in May 1990. Monthly analyses are not yet available.

Belmont 2002 Menthol LS Finland: This new LS Box cigarette will be launched in October 1990. The product specification is available.

MISCELLANEOUS

Italy: A reduction in cigarette diameter from 7.95 to 7.90mm has been accepted by the Italian Monopoly.

Finland: For cost and quality reasons, ATO will cease in-house printing and electro-perforation of tipping paper. The in-house microlaser perforation will continue.

*A. Kott*

References:

- Monitoring Report, by Kopp-A-M., dated June 15, 1990.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : MANUFACTURING SERVICES GROUP  
SUBJECT TITLE : EDP APPLICATION FOR PRODUCT SPECIFICATIONS  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Flury-C. (CAF)  
KEYWORDS : edp,application,specifications,mis,focus

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### OBJECTIVE

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Develop an EDP system to manage product specification matters, following the removal of text processing facility 8100 on which product specifications used to be prepared.

The application was intended to support, if possible, speed up, the administrator's specs maintenance tasks. It should provide easy and immediate access to specs data by all collaborators concerned, at all HQ and local functions. Manufacturing Services should be provided with a tool to enable on-line inquiries and write tailored reports of any kind. Further, the application was to be conceived in such a way that it could be compatible with and provide link possibilities to other EDP applications (SPITAB at HQ Lausanne, C.I.R and Monitoring at R&D, etc.).

### DEVELOPMENT

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Project documentation was prepared and the concept designed during spring and summer, 1989. Presentations were made to persons involved in all production centers and at R&D, and programming started in September, 1989, using SPITAB.

End December, 1989, it was decided to abandon the SPITAB package which did not offer enough facilities for the product specifications. An in-house soft was then set up in three month's time.

Today, 95% of all data are loaded. The system is extremely user-friendly. Most of the working tools are available (FOCUS). All objectives were met or are provided for, except for the direct link to HQ's SPITAB system.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### EXTENT OF APPLICATION

The product specs application covers, from the bottom to the top of the product structure:

Technical Sheets for	filter additives, semisolutions and plasticizers
	acetate tow, crepe paper
	plug wraps
	cigarette logo inks
	cigarette papers
	tipping papers

Product Specs for	filter (semis and ready for use)
	blend (basic data only)
	cigarettes

The chapter "cigarette" includes a table showing the countries of sale and the figures printed on the packs. It provides for the control of pending modifications (implementation schedule).

### STATUS AND OUTLOOK

The display access control system (DACS) will enable giving selective access to the various groups of users, within R&D, the HQ-functions in Lausanne and at production center level. In addition to the specs administrators, two test persons have presently access to the production system, one MSG-collaborator has access to the production system and to the FOCUS data base.

DACS will be subject to approval by R&D management, who will be given a presentation of the specs application during the second half of August. Other presentations will then follow, at all locations.

C. Flury



CAF/July 06, 1990  
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EDP SUPPORT GROUP

RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

DIVISION : COMPUTER APPLICATIONS  
SUBJECT TITLE : APPLICATIONS AND ACTIVITIES  
PERIOD COVERED : APRIL - JUNE 1990  
WRITTEN BY : Y. WONG (YIW)  
KEYWORDS : Beckman/CALS, digimetry, COLDAC, FOCUS, CSP,  
FORTRAN, CICS, STAIRS, PROFS, IMP, product  
specifications, smoking lab, conversion,  
migration, EDC

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MIGRATION / CONVERSION TO EDC (EUROPEAN DATA CENTER)

- R&D System Environment

The R&D system environment for both CICS/MVS and VM/CMS is in place.

- STAIRS (Storage and Information Retrieval System)

Significant enhancement is provided in the new version of STAIRS to enable the development of more flexible functions for creation and revision of documents. The current procedures and document-input modules which were developed in the past by FTR/ICS will not be migrated to EDC to be reused. This development is at the final test stage in the R&D CICS production system. A "Front-end" menu for authorized data-base access will be added to STAIRS. The new system is scheduled to be in operation by August.

- VM/CMS Migration

Migration of EDC to VM/CMS has been completed for SAS (Statistical Analysis System) and for APL, FOCUS, applications.

Phasing out of ADMCHART utilisation in the FTR mainframe, planned to be completed in July.

INBIFO VM administration has been transferred to R&D; training/support to INBIFO users is in process.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

### - Migration of CICS applications

Migration of R&D applications has been planned in two phases with the first beginning in March for applications developed with CSP. In the second phase, the remaining applications:

- Quality Audit / Visual Defects
- Cigarette Data Bank (CDB)
- Cigarette Information Report
- Smoking Panel

which used to be developed by FTR, will be migrated by FTR/ICS at the end of this year and later reimplemented and upgraded by MIS R&D to support current business needs.

Migration of CSP applications proceeds as scheduled. All CSP programs have been converted to run in the CICS/MVS system of EDC; COBOL-written printing procedures used in the past are being replaced by batch or CSP procedures. Testing is underway to implement a daily procedure for sending the analytical data of Smoke Lab from the VAX computer to the EDC mainframe via SNA/GATEWAY.

### NEW APPLICATIONS FOR PRODUCT / MATERIAL SPECIFICATIONS

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FOCUS data base is in place for generation of end-user type monitoring reports.

A list of authorized users from R&D, HQ and affiliates has been established by the Manufacturing Services Group (MSG). Presently, access has been defined to a limited number of users outside MSG, to test their utilization of the system.

Extension of this application to include the Casings and Flavors specifications has been requested by MSG. For decision and timing, Management has been provided with an estimation of the resources necessary for developing an application to replace the current PC system.

### SMOKING LAB / QC AUTOMATION

=====

Work planning and resources have been defined for the remaining development in CALS over the next 18 months.

A proposition of CO/NO workpost was made to PMG to use the R&D digimetry solution.

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## RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

Links between HP-1000, Digimetry and VAX passing through the NIU/Broadband network, defined and running.

### COLDAC SMOKING LABORATORY SYSTEM

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Major breakdown of one of the two HP data links. The affected workposts were redirected to the second link. More pressure is being put on the development of digimetry workposts using the broadband network facility to replace the obsolete equipment.

Two digimetry workposts for Firmness/OV measurement have been in operation since April.

Implementation of CO/NO workposts is near completion. Its operation is scheduled for the beginning of July.

### PROFS AND VM/CMS DECENTRALIZED ADMINISTRATION

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There are now 98 "userids" and 106 "nicknames" in R&D

VM Messenger Software reviewed to replace Telex

VM machine set up to receive HARDCOPY requests from CICS.

Improvement has been made on the R&D VM printing-procedure IMP; this procedure was presented to HQ and affiliates MIS during an EDC workshop on general VM printing, and will be taken as a starting point to create a generalized procedure for all affiliates.

### HARDWARE / SOFTWARE - INSTALLED / ORDERED

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- 1 Harvard Graphics software installed
- 1 LaserJet printer installed
- 1 IBM-3812 printer installed
- 1 IBM-3472G terminal installed

Review of new PS/2 software versions for LOTUS 3.0, Harvard Graphics 2.12, VISIO4 2.5.

A TEKTRONICS color jet plotter is in process of being installed in computer-users' room.

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RESEARCH AND DEVELOPMENT, NEUCHATEL - QUARTERLY REPORT

HELP DESK STATISTICS

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Number of calls	65
Number of solved problems	60

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